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What do trees have to do with it? A Forestry Guide for Communities, 2000

Maine Department of Agriculture, Conservation and Forestry

Maine Forest Service

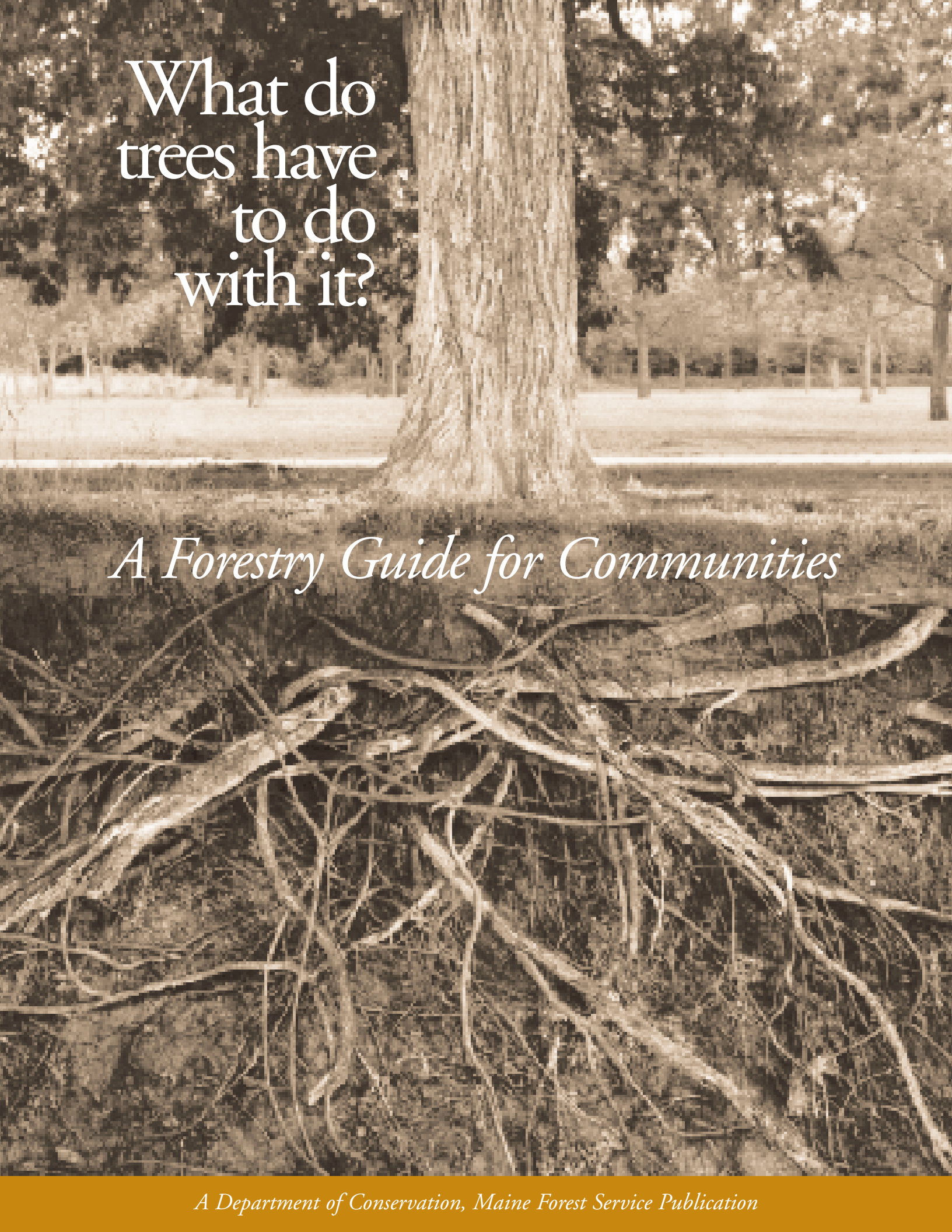
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A sepia-toned photograph of a large tree trunk in a field. The foreground is dominated by a dense network of exposed tree roots. The tree trunk is thick and textured, standing in the middle ground. The background shows a grassy field and more trees in the distance.

What do
trees have
to do
with it?

A Forestry Guide for Communities

Inside Front



What Do Trees Have To Do With It?

A Forestry Guide for Communities



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What Do Trees Have To Do With It?

A Forestry Guide for Communities

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Introduction

What do trees have to do with comprehensive land use planning? Plenty. Put street trees, town parks, community forests, small wooded properties and woodlots together and you have a major piece of community infrastructure with aesthetic appeal and economic wallop.

When trees and forests are integrated into the planning process, they can:

Significantly reduce stormwater run-off costs

Reduce soil erosion

Protect waterways from pollution

Reduce heating and air conditioning costs

Muffle traffic noise

Reduce the cost of regular municipal services like road maintenance

Offer recreational opportunities

It's almost magical that trees and forest land can offer so much, but many of the benefits they offer are both tangible and measurable in dollars and cents. For example:

► According to city data supplied to Environmental Impact RC & D, 37 medium sized trees on approximately 6 acres slowed the flow of stormwater by 37% during heavy rainfall. A comparable property with 18 trees slowed stormwater by 18%. At a typical stormwater management cost of \$2.00 per cubic foot, well-tended trees on municipal property add up to big savings.

► In-town house lots with trees and subdivision lots with adjacent forested open space, typically sell faster and for higher prices than house lots with few or no trees.

► A mid coast Maine city is currently trying to mitigate the effects of seasonal flooding. Flooding and associated costs could have been reduced if a streamside vegetation buffer, including trees, protected the stream. According to municipal officials, the cost of mitigation is four million dollars. They are also discussing settlement with adjacent homeowners who have suffered seasonal flood damage for years.

► Town owned forests managed under a well-designed forest management plan often provide enough revenue to offset the maintenance costs for recreation use, while providing a green recreation resource. Town forests also provide a whole range of other ecological and economic benefits from pollution filtration to flood control.

Community Prosperity

We all want our towns to prosper. We want vibrant communities that provide opportunities for new businesses, jobs and services. We want safe and attractive communities that provide the right place to raise a family and are good places to live and visit. Ideally, we want to be proud of the community we call home.

But what is prosperity? Is it measured by a large tax windfall that comes when a super discount store decides to build at the edge of town? Or is it measured by the increased number of visitors who come to enjoy the town or the number and variety of employment opportunities? Or is it a whole range of factors — from good public schools, to low property taxes and topnotch emergency services — that add up to make a community vibrant?

The local sawtimber and veneer mills in Strong, Maine are crucial to current prosperity. In Aroostook, agriculture is key. Aquaculture, blueberries, cranberries, lobstering and logging are big parts of the equation in Downeast Maine; tourism and wood products figure large in Western Maine; while many towns rely on high tech and service jobs to fuel their economic engines.

Maine's forests and forest industry are an important part of its economy. Ninety percent of the state is forested — a higher percentage than any other state in the country. Recent data supplied by David B. Field, Giddings Professor of Forest Policy at the University of Maine, shows that the forestry sector of the state economy (which includes timber and non-timber products and services such as maple syrup production and hunting activities) employs just short of 32,000 people. According to Field, products and services from this sector amounted to \$5.6 billion in 1996 and generated an income of over \$1 billion for employees and self-employed individuals.

But then, a prosperous community is not just made up of its jobs — or its streets and schools, the emergency services it provides and the tax revenues it collects, either. It is made up of people at restaurants and coffee shops, civic groups and reading clubs, high school sports teams, roads and town parks, neighbors and neighborhoods, backyards and wooded lots and the brooks and streams that run through them.

Not every element fits into a Comprehensive Plan, but many do — because a community is much like a piece of fabric, woven and held together by its infrastructure and its people.

Legislative Mandate: The Comprehensive Land Use Plan

Title 30-A MRSA, Chapter 187 mandates that municipalities within Maine develop a Comprehensive Plan if they are going to regulate land use. The Comprehensive Planning and Land Use Regulation Act identifies several goals, including the goal of safeguarding the “State’s agricultural and forest resources from development which threatens those resources.”

This guide is meant to supplement the State Planning Office manual *Comprehensive Planning: A Manual for Maine’s Communities* by providing more information on integrating forests and other natural resources into comprehensive and municipal planning.

First, towns must examine the role forests play in their municipality. Commercial forestry is a major local activity in some towns. In

In a state where every yard is a clearing and would grow back to forest if given a chance, an overlooked and critical piece of community infrastructure is as common as the color green.

Think forests.

Think trees.

larger towns and small cities, the local forest may rarely consist of shade trees, open space, or public parks. Once the forest inventory is complete and the information is analyzed, policy decisions that are consistent with state and local goals can be based on in-depth information. This, in turn, leads to policies and strategies specifically tailored to the needs of individual communities. Policy implementation is the final step in the process, but a Comprehensive Land Use Plan is a working document. A well-designed Plan can provide strong guidance towards making appropriate and balanced land use policy decisions, but it isn’t written in stone. It will be necessary from time to time for the town to review, reevaluate and revise these policies.

What this Guide Offers

Your knowledge and experience in community planning and decision making, combined with the background information offered in this guide will help you to consider the street trees, backyard woods, parks, community forests and public and private undeveloped forest land when making land use decisions and preparing or updating your Comprehensive Land Use Plan.

Clearly, each town will value the forest’s resources differently, but this guide provides a range of infor-

mation necessary to effectively assess the complex, interrelated forest ecosystem and associated natural resources so it can be incorporated into local planning.

Part One takes a close look at the effects of different land use decisions through exam-

ples of how trees, soil, water and wildlife habitats differ in woodlots, existing subdivisions, new subdivisions and community-owned woodlands. Economic and recreation factors are also explored.

Part Two is a forest and natural resources primer for planners and others involved in the comprehensive planning process. It provides background information to assist in the inventory and analysis stages of the planning process.

Part Three provides decision-making guidelines for including trees and forests in the comprehensive land use planning process. It is meant to supplement the State Planning Office manual as well as serve as a reference document.

Part Four provides a range of resources available to assist communities in integrating forestry and related natural resource management into the nuts and bolts of the planning process.

Part Five provides information for landowners in Clip-n-Copy pages that are easy to copy and distribute.

A glossary of forestry and tree-related terms are provided in the back of the guide.

The Fabric of the Community

What happens if you pull on one thread in a piece of fabric? If it is a small enough tug, the threads

may realign slightly and create a barely noticeable change. If it is a crucial thread, or if many little threads are tugged, then the whole fabric changes.

Communities are much the same; a small change will have little overall effect, whereas many small changes add up and can affect the very structure and character of a community indefinitely.

Many towns and cities are changing fast. The fabric of communities across the state is most certainly being tugged and stretched by land use changes.

Those involved in comprehensive planning decisions are charged with being today's guardians and tomorrow's stewards of the community. They have to try to balance budgets, provide services and encourage growth while keeping taxes low and communities vital.

Planning often involves difficult choices. Some land use decisions will pull at critical threads that realign a community,

shape it and change it forever into something different. That change can be a good thing; it can add up to prosperity and progress. Or it can add up to burdensome expenses and changes in community character so deep that vitality seeps away over a few short years.

The trick is to know which threads are crucial so it is clear what will happen if they're pulled. The best any community can do is have a thorough understanding of the effects of making land use decisions before those decisions are made and implemented. And to do that, they

need effective tools that are easy to find and easy to use. Tools that allow those involved in community planning to effectively identify those critical threads in the community fabric, to weigh the costs and benefits of land use decisions that pull one of those threads and to determine what impact a land use planning decision will have on community vitality in the short and long terms.

Certainly, municipalities are faced with a wide range of weighty planning decisions. Behind them all is a feature so common in the land-

scape that it appears almost irrelevant in the planning process; a feature so quietly present that is easy to overlook as an essential force in shaping many of our cities, towns and communities throughout history — yet a feature as much a part of the physical infrastructure of a community as its buildings and roads.

Think forests.

Think trees.

It is always a good idea to look for a licensed professional forester to join your Comprehensive Planning Committee or Conservation Commission. They can provide insights into relationships between trees, water quality, erosion, development, economics and more. For information on how to find a forester in your area, contact the Maine Forest Service at 1-800-367-0223.

Close-up Examples of the Effects of Land Use Decisions

Pieces of the Community Puzzle: How it all Fits Together

Knowing how wooded properties and street trees work will show how they can offer so many benefits. Let's look at different examples that are likely to be found in your community or other communities across the state. Town and development names are fictitious in the following examples, but the situations are from real life in Maine cities and towns.

The Ames Property: Thirty Acres at the Edge of Town

The Ames are a retired couple who own thirty acres of mixed hardwoods, made up primarily of maple and white pine, on the outskirts of the town of Clamville. Their house and lawn are at the edge of the property, near the road. A stream runs through the northeast edge of the property and another section is wet from late winter until mid-summer. The back twenty acres are rolling, but not steep (<25% slope). It is a typical thirty acre woodlot.

Soil is similar to the foundation of a house: essential to the stability of what is above ground and not very noticeable until something goes wrong. On the Ames property, the soil is doing a good job. It is full of hidden life, from tiny creatures invisible to the eye, to burrowing animals such as moles and earthworms. These billions of tiny excavators are at work churning old leaves and dead wood into nutri-

ent-rich soil. All that miniature excavating also mixes the soil, allowing oxygen to penetrate and water to soak into the ground through countless tiny holes.

When it rains, some water runs off into the stream, but much of it is soaked up by tree roots and the air pockets in the soil. They act like sponges by soaking up water and releasing it slowly. Leaves intercept and slow down heavy rain so that it hits the forest floor more softly. The result: less splash, less disturbed soil, less erosion and less run-off. Both water and nutrients are sucked up through tree roots and the roots of other plants. Trees circulate some water — most of which evaporates out of leaves and

Leaves intercept and slow down heavy rain so that it hits the forest floor more softly. The result: less splash, less disturbed soil, less erosion and less run-off.

needles during the growing season, creating a localized cooling effect much like when sweat dries and cools the human body.

In addition to millions of soil critters, this property provides wildlife habitat (*homes, food, water and hiding, resting and nesting places*) for a range of wildlife from migrating songbirds to white-tailed deer. Snowshoe hare and deer eat red maple buds in winter. Ruffed grouse, commonly known as partridge, feed on the buds of poplar trees. A vernal pool, a temporary big puddle created by melting snow and rain in the spring, is located in the wet part of the woods. Vernal

pools are common woodland features across the state; they provides homes for frogs, fairy shrimp and two salamanders — including the rare blue spotted salamander. These pools dry up in late summer and fall, making it difficult to detect their location late in the growing season when ferns and trees are the most obvious features.

The stream running through the property is a convenient year-round water source for wildlife. As it leaves the property, it crosses an open field. Trees and shrubs growing in a wide strip along the streambanks act as an important travel corridor for wildlife that move from the Ames woods to smaller wooded properties on the other side of the field.

White-tailed deer, woodcock, snowshoe hare, chipmunks, songbirds and many other wildlife use this wooded travel corridor to cross from one property to the next.

Standing dead trees, or snags, are fairly common on the Ames property. Up to eighty species of Maine wildlife use snags during some part of their lives.

Woodpeckers, chickadees and other birds pick insects off the decaying bark. Some birds and owls use the same snag as a nesting site year after year. Hawks use them for hunting viewpoints and moles burrow beneath their roots. As snags decay, they return nutrients to the soil and encourage new plants and trees to grow. Even though they are dead, they are an important piece of the ecological puzzle on the Ames property.

The Ames enjoy and use their property for recreation and wood products. They appreciate the spring woodland wildflowers and the colorful leaves in the fall. Their grandchildren build tree forts and catch frogs in the woods. Their son hunts turkey and deer on the property. For years, they've used a simple trail for walking the dog and cross country skiing. Since they heat with wood, their property also supplies a fair amount of firewood.

They're attached to their property, but they also need to be practical from an economic point of view. Increased jobs in nearby Clamville and newcomers who have moved to the area to take advantage of them, have fueled climbing real estate prices in recent years. Subdivisions and new homes in the vicinity of the Ames property resulted in an increase in the assessed value of their land. Clamville's mill rate rose to cover increased municipal costs the year after the Ames retired. Now on a retirement income, the Ames realized they could no longer afford to pay the taxes on all of their property. They discussed subdividing their property, but also explored other options that would allow them to keep their property while lowering their taxes.

Ultimately, they decided to enroll in the Tree Growth Tax Program, which values their property from a tree growing standpoint instead of for its development potential. The property was reassessed at \$150 an acre, the current standard rate for an acre of mixed hardwoods. Compared with the regular assessment of \$2,000 an acre, the Ames were able to reduce

their property tax burden dramatically.

The Tree Growth Tax program requires a minimum of ten acres for enrollment. Those enrolled in the program must hire a licensed professional forester to develop a forest management plan for the property and be willing to cut some trees for commercial sale. At first, the Ames were reluctant to do this: they thought enrollment in the program meant they were required to clear-cut their property or that a timber harvest would leave a mess. They also didn't like the idea that someone else would tell them what to

twenty-five of their thirty acres into Tree Growth.

Following the woodland management plan put together by their forester, they contracted with a logger to remove six cords per acre on each of the twenty-five acres in Tree Growth while leaving the vernal pool and the areas around the stream untouched. They marked two snags to leave standing for wildlife and left downed trees for drumming sites for ruffed grouse.

Working with their forester, who negotiated with the logger, they had some red maple and birch

taken out for their own use as firewood, then sold the logger some white pine and other species which he sold to the sawmill to make railroad ties. The stumpage, or the amount paid to them for the standing trees, was \$4,500.

The tree harvest was done when the ground was frozen to avoid creating ruts and muddying the stream. Care was also

The Ames were able to put soil and water conservation into practice, improve wildlife habitat for some species, protect sensitive ecological areas, improve recreation opportunities, enhance the beauty of their woods, lay in a two year supply of firewood, reduce their property taxes and realize some income from their property. Is their situation unusual? Not at all.

do on with their property.

After consulting with a licensed forester, they discovered that the overall health of many trees was declining because of the age and number of trees on their property. Many poplar were old and had broken tops. Some were safety hazards. The white pine, which they liked, was getting crowded in by the red maple. They also found they could make some income by removing some trees while improving wildlife habitat for many species at the same time and still keep the woods looking much the same. Because they were not interested in any kind of commercial activity near the house, they decided to put

taken so remaining trees were not damaged by logging equipment. Slash collected into four foot piles serve as hiding places for some wildlife and nesting sites for wild turkey. The forester, logger and landowner also worked together to lay out skidder trails that could be used for cross country skiing trails after the logging operation was finished.

The Ames were able to put soil and water conservation into practice, improve wildlife habitat for some species, protect sensitive ecological areas, improve recreation opportunities, enhance the beauty of their woods, lay in a two year supply of firewood, reduce their

property taxes and realize some income from their property.

Is their situation unusual? Not at all. This is a common example of a thirty acre parcel of mixed hardwoods with some softwoods found near many towns throughout the state. Depending on landowner interests, many more opportunities for recreation and income exist — from woodland wildflower gardening to growing specialty mushrooms and herbs — opportunities that are compatible with woodland management and conservation minded goals.

The actions the Ames took not only benefit them, but they also help keep a piece of land truly rural — a characteristic that is intrinsically associated with the woods and fields of Maine. Their conscientious protection of soil and water helps keep the stream from being polluted and helps regulate water levels downstream.

The decision to put two thirds of the property in Tree Growth does not cost the town money in lost tax revenue. The state reimburses the town for 90% of the difference. Furthermore, the property supports only one household, instead of a dozen or more. There is no cost to the town for providing sewage and water, mitigating increased stormwater run-off, increased road maintenance for heavy traffic, or other costs associated with increased residential development.

WildAcre: A Traditional Residential Development in the Woods

On the other side of the field from the Ames is WildAcre, a new housing development on thirty

Two acres, three acre, even five acre lots are too small for timber management, too small to provide much wildlife habitat and too small to protect watersheds or rural views.

acres that is similar to many that have gone up in Clamville and surrounding towns. Clamville has a two acre minimum lot size. They decided on this with the intention of keeping the rural feel of the area and providing privacy to homeowners. The development has thirteen two-acre house lots, with four of the thirty acres either too wet or too steep for building. All thirteen houses are set back from the access road and from each other, so each house is located more or less in the middle of each lot. Each is a four bedroom house. Most houses are surrounded by some lawn, with the woods beyond. It's a typical development set-up, with a loop road allowing easy access for emergency vehicles like fire engines.

What do trees have to do with this, except that they provide privacy from the neighbors?

The soil of this property acts differently than on the Ames property. Where there are tree roots and shrubs, it continues to serve as a natural sponge by soaking up rain water and releasing it slowly. Rainwater that hits roofs, driveways and access roads acts differently:

some of it runs off into the stream, taking some soil, drops of motor oil, lawn chemicals and other particles and deposits them in the stream where they become pollutants — which affects some small wildlife that are, themselves, food sources for larger forest wildlife.

Lawns do not function the same way as forest or shrubby areas, either. They are not effective sponges, but act like green asphalt. Most of the water that falls on a lawn runs off.

Wooded areas soak up, store and release up to fifty times more water than neatly tended lawns (Arendt, 1999).

Some woodland wildlife require small territories and thrive on small properties, but many need larger areas to do their daily jobs of living and raising a family. The white-tailed deer, for example, find WildAcre development attractive and feed in backyards, but they also use the creek corridor to cross the open field on the adjacent property to return to the Ames woods. Deer, in fact, seem to fair well enough in a patchwork landscape of woodland development, as do raccoons, skunks, squirrels and some birds. Chickadees and goldfinches come to feeders at WildAcre, but scarlet tanagers and some other birds no longer find favorable nesting habitat at WildAcre.

There is no longer enough moist shade in the woods for frogs and salamanders to thrive in the vernal pool on the property. Snags and down trees understandably needed to be removed due to safety concerns, but their removal also diminished wildlife habitat.

Many of the residents of WildAcre would prefer a larger property and the other benefits that the Ames enjoy, but they can't afford it. So they enjoy the field next to the development, the rural look of the Ames property and their own backyard gardens that they tend on weekends.

In the interest of maintaining the rural character of the community, the town passed an ordinance with a two acre minimum lot size. WildAcre developers followed the rules and built it. Are 13-lot subdivisions even appropriate in a town trying to retain rural character? Unintentionally, Clamville encouraged sprawl to spread across the landscape while losing the rural character they sought to maintain. Two acres, three acre, even five acre lots are too small for timber management, too small to provide much wildlife habitat, too small to protect watersheds or rural views, too small to do much but create a checker-board landscape of houses and house lots — each indistinguishable from the next.

A simple build-out analysis would have shown what the development would cost the town compared to how much revenue it would generate. If you do the math, the message is clear: standard style subdivisions cost the town money. Increased taxes are the typical result.

And what can you do about it, anyway? Stop building houses in the woods? That's probably not going to happen.

Drumlin Woods: A New Kind of Subdivision

Some development is inevitable, but it is possible that woods and natural resources can be conserved and used at the same time. It's worthwhile to look at the town in a more comprehensive way and to put planning and zoning into the bigger picture of community vitality. Will this cost the town in revenue, the developer in profits and lower the value of real estate? The answer is no: just the opposite. Conservation planning in development design is easy to implement, saves municipal money, invites developers since they are likely to recognize higher profits than with conventional residential development design, and often results in increased equity, and an increased sense of community.

Picture a view of a field, a pond, or the woods out your front window, with no buildings obstructing the view. Picture a private backyard with trails that lead around thirty acres of woods, taking advantage of much the same woodland features enjoyed by the Ames: wildflowers, turkeys, clean streams, cross-county skiing, hiking, bird song and chorusing frogs.

Sounds good. How does it work?

A thirty acre parcel (*twenty-five acres of woods and five acres of field*) in Blodgettville, the next town down the road, was planned by a developer with a vision that a conservation-style residential development would also look good if it was planned well, and that house lots would sell well at premium prices.

The town's zoning ordinance called for a density of nine dwellings per twenty acres. Based on traditional subdivision design, a wet area unsuitable for building would be removed from potential development, resulting in thirteen house lots of approximately two acres in size on twenty six acres of land.

But the Blodgettville subdivision ordinance allowed for smaller lot sizes without a change in density. In other words, the developer could create house lots that were smaller than two acres, but he still couldn't put more than thirteen houses on the twenty-six acres. To achieve a high quality new style subdivision, the developer followed four basic steps to conservation subdivision design layout as outlined in *Growing Greener: Putting Conservation into Local Plans and Ordinances* by Randall Arendt (*See Additional Resources for more information*). A summary of Arendt's process follows:

Steps to conservation design

► Step One:

Identify Conservation Areas

This property is fairly flat, with young poplar, cherry, white birch, gray birch, balsam fir and alders growing in the damp area. Most of the property is old pasture land that grew up into medium to large sized poplar, gray birch and white birch. Recent winter storms broke many poplar branches. A dense thicket of shade-tolerant spruce, partially shade-tolerant balsam fir and white pine are growing up beneath the sun-loving hardwoods. None of the spruce and fir are taller than 25 feet high, and most are spindly due to the crowded growing conditions.

Old stone walls that used to border field edge-rows run through woods that have grown where fields used to be. An old white pine with a dead top growing next to one of the walls was standing when this property was a farm field instead of woods. Three acres of hemlock at one back corner of the property marks the edge of a larger hemlock stand located on the neighboring property.

Identified conservation areas include the damp area and the hemlock stand, which is part of a larger deer wintering area that is also important habitat for wintering birds. Several big white pines on the property are important wildlife trees while the poplar provides wildlife food sources for many species in the winter, from cedar waxwings to ruffed grouse.

► *Step Two:*
Layout House Sites

Once these conservation areas are identified, the location of house sites comes next — with the intention of keeping as much wooded property as possible, while still creating a quality development. House sites are situated to maximize enjoyment and access to the conservation areas in the development, promote a neighborhood feeling, maintain privacy, and take advantage of good views.

► *Step Three:*
Layout Streets and Trails

Streets are drawn into the design while minimizing the impact on the conservation areas. Access for emergency vehicles such

as fire engines, which require minimum road surface width of twenty feet and two routes of access in and out of the development, are also taken into account.

► *Step Four:*
Drawing in Lot Lines

Finally, lot boundaries are drawn. Since this development will not rely on public water and sewage, each lot must be large enough to accommodate a well and a septic system. The average size is three quarters of an acre, resulting in thirteen dwellings with a total 9.75 acres developed — leaving approximately twenty acres undeveloped.

What does Drumlin Woods look like?

Flexibility in the subdivision zoning ordinance allowed developers to situate house sites to maximize views and sunlight. Each home has an unobstructed view of the woods or the field. While Drumlin Woods house lots are smaller than on the standard subdivi-

Trees and shrubs planted within one hundred feet of houses are non-evergreen — which are less likely than evergreens to ignite or spread a wildfire.

vision lots at WildAcre (*3/4 acre lots at Drumlin Woods compared to two acre lots at WildAcre*), the adjacent open space of woods and fields makes the property feel expansive. And it is. Twenty acres of the development remain undeveloped and are protected by a conservation easement, held by a local land trust that was brought into the process by the developer. The entry road

into the development skirts the edge of the field like a country lane and exits through the woods, providing access for emergency vehicles from two points. No houses border the entry road. The field beside it is home to bluebirds, swallows and dragonflies. Designed intentionally to keep both the feeling of a rural landscape and to keep the quality of the open space intact, the entry road is an important aspect of the appeal of Drumlin Woods.

Following guidelines for reducing forest fire hazards in planning a new development, trees and shrubs planted within one hundred feet of houses are non-evergreen, thus less likely to ignite or spread a fire. Also in accordance with Maine Forest Service recommendations, houses are not located in the woods. Instead, a space or “fuel break” of open ground separates the houses from the full woods. National wildfire prevention experts often recommend a large fuel break be maintained as a mowed lawn, but the less volatile woods in Maine call for more moderate measures that bal-

ance safety, erosion control, water retention and other values. As a result, the backyards in Drumlin Woods subdivision are a mix of fruit trees, hedges, wildflowers, traditional landscaping and smaller mowed lawns, depending on the interests of individual homeowners.

During the process of turning these thirty acres into a development, the developer hired a forester to thoroughly evaluate the standing timber on the property with the aim of taking out valuable timber while keeping the aesthetic value of the woods. Skidder trails were located so they could later be used

for walking trails. The forester worked with the logger and the developer to harvest wood from the future house sites and the conservation area while increasing the overall health and beauty of the woods, increasing non-motorized access into the woods, and retaining and creating some wildlife habitat features. After the timber harvest was finished, the skidder trails were seeded with a wild plant seed mix that grew grass-like over the trails, making them attractive walking paths that also provide forage for some species of wildlife. This neighborhood trail network was part of the subdivision design and provides residents of Drumlin Woods access to a walking trail that wanders through most of the twenty acres of undeveloped land.

Drumlin Woods subdivision feels open, uncrowded and private — as if each resident had a house next to a private woodland. Essentially, they all do.

What are the advantages to the town?

Since a conservation subdivision is based on the same density as a standard subdivision, the tax revenue the town receives is the same — but the costs of municipal services go down. The conservation design requires less roads than a conventional development, resulting in less road maintenance and plowing in winter. Since less land is converted to asphalt or to lawns, less stormwater runs off. The water that does run-off is caught by specialized vegetation in the field area and is naturally filtered on site. Sewage can be handled by individual septic systems, reducing the need for town sewage.

The open space in Drumlin Woods, which is a combination of

the field and woods, provides a noise and sight buffer between residents and the traditional rural pursuits on the property next door. The buffer makes for good neighbors. Residents of Drumlin Woods and the farmer next door have avoided a common conflict: the noise of early morning farming machinery and the smell of manure — typical conflicts that are often brought to the town to resolve.

The town is in the process of revising its Comprehensive Land Use Plan to map out conservation green areas town-wide. This map will be used as a guide for development. Potential connecting “greenways” from one development to the next will hook up with undeveloped town and other publicly owned properties to provide ribbons of wooded and natural areas that benefit the town by providing recreation and ecological values and by reducing municipal costs. Conservation subdivisions like Drumlin Woods also provide cost-free open space to the town, even though the woods in the subdivision are only available to the homeowners. If other subdivisions follow conservation design methods of development, the open space provided to residents will take some of the pressure off the town to be responsible for buying and maintaining parks and woods on its own.

Blodgettville benefits from the rural look and character of Drumlin Woods: visitors and residents alike find it attractive. Beyond its aesthetic appeal is the municipal savings associated with less stormwater runoff, less town sewage services, less road maintenance, more wildlife habitat and more recreation opportunities right outside the back door.

What are the advantages to the developer?

The developer is in a better situation with Drumlin Woods than if he had followed standard subdivision designs and put the same number of houses on larger lots. The number of house lots is the same as in a conventional development, but there is less land to clear, less earth to move and fewer roads to build. Less stormwater run-off means smaller and less expensive solutions to stormwater disposal, too.

Since many environmental concerns were addressed up front in the actual subdivision design, this fostered a better working relationship between the developer and the town. The developer also put the trail system, field and other open space features in before he sold house lots. In this way, he was able to use these features to market the lots. The Drumlin Woods lots, with views of open space and access to a trail network, sold faster and for more money than comparable lots in WildAcre (*conservation subdivision house lots sell for approximately \$5,000 to \$15,000 more than those in conventional subdivisions*).

What are the advantages to the homeowner?

Homeowners benefit from the conservation planning done by the developer. They have views of woods and fields, not houses. They see butterflies, fireflies, wildflowers and songbirds in the field and have access to woodland trails right outside their doors. The landscape looks developed, but still feels rural. The layout of the subdivision encourages a sense of community feeling, as neighbors greet each other on the trails, but privacy is not compromised. Due to these assets, home equity increased more

in a shorter period of time than it has for comparable homes in WildAcre. People want these homes: the open space feature is a hot commodity.

What are the advantages to the environment?

Many of the benefits to the environment in Drumlin Woods are the same as on the Ames property. The development has intact wildlife habitat large enough to support a variety of species. Wildlife travel corridors and migratory habitat have been left undeveloped, thus retaining a critical link in the “greenway” system. Less stormwater runs off Drumlin Woods because it has less asphalt and less area in lawns. The result is greater water quality protection in brooks, rivers and lakes, and superior recharge of underground aquifers. If more subdivisions like Drumlin Woods are built throughout the town of Blodgettville, the result will be less fluctuations in above-ground and below-ground water levels which will result in less potential flooding and less impact from drought.

The St. Christopher Town Forest

The town of St. Christopher owns a forty acre property of mixed northern hardwoods — primarily oak, birch and red maple. Some large white pines and some poplar also grow on the property. The St. Christopher Recreation Department makes decisions about the forest, but many community groups use it, including the local snowmobile club, a bird watching group, the nearby elementary school and a horseback riding club. In the past, trails have been haphazardly maintained.

It had been many years since timber was harvested from the property. Many poplar and oak with broken limbs became a hazard to trail users after a recent winter storm, so the Town Recreation Department decided it was probably time to cut some trees. The town consulted a logger, who offered them \$2000 stumpage for the biggest trees on the property. Unsure if this was a good value, the town manager mentioned he had seen a “Call Before You Cut” bumper sticker on a pick-up truck that suggested calling the Maine Forest Service for advice before harvesting timber.

A Maine Forest Service field forester visited the town forest and suggested the town consider hiring a licensed forester to help them before hiring a logger.

After assessing the property and taking into account the objectives of the community user groups, the licensed private forester prepared a woodland management plan that outlined what the town needed to do to balance the objectives of the user groups (recreation and education) with safety, a sustainable wood supply over time, and improvement of the overall ecological conditions of the woods.

Since trees were older and grew close together, the growth rate of the trees was very slow. Many short-lived species, like gray birch and poplar, were nearing the end of their life spans. Due to broken tops and broken branches caused by winter storms, they also created safety hazards that needed to be removed. The licensed professional forester recommended an improvement cut that would take out most of the broken poplar and birch and some of the unhealthy oak and red maple. Taking into consideration

the aesthetic value of the woods, the licensed professional forester suggested encouraging the stately red oak in the stand, while keeping a diversity of sizes and species of trees that would provide wildlife habitat for woodland birds, including some snags that did not pose a safety hazard. The improvement cut would amount to removing about six cords of wood per acre to be sold as pallet logs and saw logs. She suggested no timber be harvested from about three acres that were covered with a thriving population of dainty lady slippers in the spring, since the increased sunlight coming through the canopy of the woods might be too strong for the flowers. The overall result of these forest management practices would be a healthier and more diverse forest that also looks good.

In the interest of minimizing the visual impact of a timber harvest, the forester recommended a mechanized operation where trees are cut to length by the harvesting equipment and processed for transport in the woods. This required smaller skidder trails than a conventional logging operation and did not require a large open landing for loading and hauling. She also recommended the logging operation be done in winter when the ground was frozen in order to reduce the risk of erosion and sedimentation of a stream that runs through the property. Since logging equipment must cross the stream, the logger planned to build a sturdy temporary bridge to cross it. The forester advised the town to secure a permit from the Maine Department of Environmental Protection that would allow them to keep the bridge after the timber harvest was finished, and incorporate it into their trail system.

Under supervision from the licensed professional forester, the logger used existing trails for harvesting equipment and created new ones when necessary. After the harvest was completed, new trails were seeded with a conservation seed mix that grew to a grassy path that looks good, stabilizes the soil and created forage for wildlife.

Under the management plan developed by the licensed forester, users of the town forest found their recreation opportunities enhanced. The forest continued to serve its important functions of water retention, regulation and soil stability. Wildlife habitat improved for many species. The forest was healthier overall, and the town can look forward to income from another timber harvest down the road while knowing they are working to increase the use and health of the woods.

There was no economic need, either, to take the best and leave the rest. The town received a \$2000 stumpage payment from the logger for the timber removed in an improvement cut — the same amount of income they would have received if other objectives, like recreation, weren't considered. They also have a much healthier woodland as a result.

The result is a town forest with filtered shade cast by stately red oak. Star flowers and hepatica bloom in the understory in the early spring and the calls of May songbirds come from the treetops and the thickets. Late spring and early summer find a magical grove carpeted with ferns and pink lady slippers. Horseback riders used to muddy the stream when they crossed it, but the bridge they now use keeps the water clear. School children took on the school project of creating a nature trail on one of

the newly created and seeded woodland trails. The town approached the winter snowmobile club and the summer horseback riders to see if they would be willing to voluntarily maintain trails during the season of their heaviest use. They agreed to do so. The result of well-informed decision making about what the forest offers and how to best enhance those values, combined with an effort to involve the community user groups who had an established interest in the woodland, led the community to enhance a previously ignored natural area into a showcase woodland that is now a valuable community resource.

The Street Trees of Haskawamkeag

Like many Maine towns, the streets of Haskawamkeag used to be lined with stately elm trees that shaded and added regal beauty to the town. After the elms succumbed to Dutch Elm disease in the 1970's, the town planted red maples in their place. Unable to tolerate winter road salt, the red maples also died and were removed. The area where street trees grew was replaced with concrete and the streets of Haskawamkeag stood naked, with no protection from wind and grit in winter or from the hot summer sun.

A local member of the garden club initiated a renewed interest in town street trees. He read a short newspaper article about grants available from the Maine Forest Service to start-up local community forestry programs, clipped it, and brought it to the next garden club meeting. The garden club decided to contact the Community Forester at the Maine Forest Service to see if

they could get money to plant new street trees. They discovered they could do much more; the town of Haskawamkeag could apply for a grant that would pay for professional guidance in how to choose appropriate trees for the town, how those trees fit into the overall picture of the town, how to plant and care for them, and how to assess the health and life spans of existing street trees and trees on town property. This would allow the community to look at the layout of town trees in the whole community, and approach tree care and planting from a town-wide perspective. Some money was also available to pay for tree planting, but the town would need to pay for watering and share the cost of maintenance.

Armed with a vision of the cool shaded streets they remembered from childhood summers, key members of the garden club approached town selectmen with this information. Selectmen were not particularly interested. The red maple plantings had been an expensive failure. Other towns that planted evergreens in concrete containers to avoid problems with road salt had run into vandalism problems. A less-than-model citizen had cut down one container grown spruce and used it as a Christmas tree until the theft was reported and the tree was confiscated as criminal evidence.

Members of the garden club encouraged town selectmen to look into the idea further, and they agreed to do so if garden club members were willing to do the legwork. The garden club members agreed.

Maine Forest Service Community Forestry Program

Provides information and assists communities in forming local tree care programs. 1-800-367-0223

In talking further with the Maine Forest Service community forester, the garden club discovered a long list of benefits that street trees and trees on public property could offer the town.

They were surprised to find that trees could effectively reduce the cost of heating and cooling municipal buildings. The garden club also received guidelines for writing a grant proposal to start a Community Forestry program in Haskawamkeag. Selectman inquired if garden club members were willing to draft a grant to secure the start up money from the Maine Forest Service. They agreed. Selectmen reviewed the grant request once it was drafted, made a few changes and submitted it to the Community Forestry Program of the Maine Forest Service.

Haskawamkeag received an \$8000 grant from the Community Forestry Program of the Maine Forest Service to do the following:

- Hire a consultant to do an inventory of existing street trees in the community, assess areas to see if they were suitable for planting new trees, and assess the town's objectives in regards to caring for street trees. The consultant compiled this in the Haskawamkeag Community Forestry Management Plan.

- Cover the initial cost of planting trees.

- Cover 50% of tree maintenance.

The community forestry management plan identified the town's primary objectives of planting street trees as (1) to enhance beauty of town streets (2) to reduce stormwater run-off and (3) to provide shade and reduce heat on Main Street. An inventory of existing street trees

Towns shaded by street trees tend to attract shoppers for longer periods of time. While they linger, they tend to spend money.

showed that many were growing old. They provided maximum shade, but they were also nearing the end of their life span. Main Street and main side streets had no street trees at all; the area where elms and maples grew was paved with wide concrete sidewalks when the trees died.

The Haskawamkeag plan recommended planting several different tree species to minimize the risk of a disease or insect epidemic wiping out all of the street trees. Efforts initially focused on replacing trees on Main Street and the main side streets. The plan recommended that trees be planted far enough back from the curb to be out of reach of road salt and plows. On Main Street, the plan recommended that every fourth square of concrete in the middle of the 15 foot wide sidewalk be removed to create a row of street trees that would be far enough away from the curb to avoid salt and plow damage and far enough away from shop doors to

keep from impeding entry. Within a year of bringing up the idea at a garden club meeting, Main Street was lined with green ash, hawthorn and maples 8-10 feet in height.

The Haskawamkeag community forestry plan also suggested the town establish a citizens tree board to review information and make tree care recommendations to the selectmen. Garden club members and other members of the community joined together to form the board.

In addition to recommending a maintenance and water schedule that was adopted by the selectmen, the tree board held an informational meeting with the chamber of commerce to introduce the benefits

that street trees have on local commerce. As a result, the chamber agreed to donate \$2,500 for street tree maintenance.

Tree board members introduced an "Adopt-a-Tree" program to Haskawamkeag middle school teachers and students during Arbor Week in May. Pairs of students were assigned to adopt a tree and learn all they could about that species. Two enthusiastic students adopted red maple (*Acer rubrum*). They found that it provides food for wildlife in every season of the year, wood for cabinetry and fine colonial-style furniture, and firewood for heating. While not as sweet as sugar maple, red maple can also be tapped in the spring to make maple syrup. As a result of their assignments, these and other students began to look at the trees they investigated with a friendly and protective regard.

Street and shade trees fared well from the choices made by the town to hire a consultant and establish a tree board. The consul-

tant's recommendations on which species to plant and where to locate them, combined with a maintenance and watering schedule that was drafted by the tree board and administered by the town, show results. Thriving maples, hawthorn and green ash line Main Street and side streets. Within a year, stakes and guy wires supporting the transplants were removed and this new generation of town shade trees approaches fifteen feet in height. With proper pruning, watering and other maintenance, these trees will add stately beauty and grace to the town as they grow, while offering a host of other unseen benefits — such as attracting visitors to stroll,

linger and shop at a leisurely pace. The town of Haskawamkeag is well on its way towards clothing its streets with trees and reclaiming the beauty and charm of its downtown area.

Yesterday, Today and Tomorrow

We can't go back to yesterday and we aren't standing still. We have a choice what the future looks like in our towns and the time to make those decisions is right now. We can have WildAcre subdivisions laid out across the woods and hills we love, or we can work with community groups, landowners, developers and town decision makers to

create vital communities while balancing our demands with those of the land. We can create comprehensive plans and ordinances that balance working forests with woodland developments, woodland preserves with recreation areas, traditional forest based occupations with high tech industry, and street trees with retail commerce. We can protect and use our woods and water and the natural resources associated with them. We all — homeowners, town officials, developers, contractors, citizens and visitors — stand to benefit from incorporating the green infrastructure of our state into long term planning.

Part Two

Forest and Natural Resource Primer for Planners

Before the actual inventory and analysis phase begins, a research phase may be necessary to broaden the knowledge base of those involved in the comprehensive planning process. Background information on tree and forest management at the town level, forestry and forest management issues, ecological fundamentals and other issues facing Maine landowners will make the inventory and analysis stages of the comprehensive plan process easier and more effective.

This section is presented as a resource primer to aid in the research process. Any unusual terms are defined in the glossary at the back of the guide. See the Additional Resources section in the back of the guide for directions on how to find more information on specific topics.

Community Tree Management and Forest Management at the Municipal Level

Community Forestry

The first town common in our state was created 200 years ago in Union as a place for people to gather, exchange information and graze livestock. The importance of green spaces within a community hasn't dwindled over the centuries, even as land use changed. Today, many municipalities throughout the state set aside green spaces for public benefit. Interest in actively managing these spaces for downtown parks or town forests has grown in recent years and is likely to increase as more is known about the wide range of benefits offered by community forestry resources.

Trees, vegetation and other nat-

ural resources tend to be overlooked as integral components of community infrastructure. The important contributions they provide should be recognized during the planning stage of community development as well as in daily municipal operations. It is much easier, and far more economical, to protect and manage existing natural areas than to restore degraded ones.

Community Forestry has advanced beyond street tree planting and management to address the stewardship of natural resources located in and around communities. Assistance is available from the Maine Forest Service Community Forestry Program, which helps municipalities develop local street and shade tree programs.

Why are Trees Important to the Community?

Increase property values by as much as 20%.

Reduce surface water runoff: rate and volume are lower in forested areas than in developed areas.

Trees increase recharge of groundwater while reducing the amount of pollutants reaching streams and other waterways.

Proper tree planting provides summer shade and reduces winter winds. Savings can be as much as 20% in heating and cooling costs.

Trees help filter air pollution, absorb CO₂ and absorb other greenhouse gasses.

Reduce noise pollution. Trees create a quieter environment by absorbing sound.

Trees can screen different land use areas and hide undesirable views.

— Community Forestry and Urban Growth, Washington State of Natural Resources, Dec. 1994.

Aesthetics

Maine is the most forested state in the country. According to David B. Field, Giddings Professor of Forest Policy at the University of Maine, over 90% of the land surface of Maine is covered with forest, and more of it is privately owned (95%) than in any other state. The visual appeal of the forested landscape contributes to the historical and contemporary character and identity of the state. Whether in the wildness of the northern regions or the settled landscape of southern Maine, sustaining the visual quality of the forest is important to our quality of life.

Maine citizens often express concerns about the health and integrity of the forest based on how it looks. How a forest "looks" is not always the best assessment for whether a property is being well managed from an ecological or environmental point of view, but timber harvesting that minimizes the most visually offensive aspects of logging can avoid creating conditions that communicate wastefulness, sloppiness and site destruction to the general public.

Timber Harvest Practices

Forest practices in Maine have generated debate and controversy since the middle of the 19th century. Although clearcutting has generated the most controversy, other timber harvest methods account for more than 90% of all harvesting in the state. How timber harvests are conducted affects the continuous flow of wood products and other values from Maine's forests. Different harvest practices are used in different circumstances, but professional foresters recognize three scientifically based harvesting methods; which one is used depends on the landowner's objectives, the forest type and the condition of the forest on a particular property.

Selection harvests remove some trees of all sizes (*trees more or less of the same size are grouped together in what is known as a size class*). Trees are removed either singly or in small groups with the goal of encouraging new trees to grow (*a process known as regeneration*). A selection harvest maintains a forest stand with trees of different size classes. This is typically referred to as a multi-aged stand structure.

Shelterwood harvests remove trees from a forest stand in two or more stages. The initial harvest removes most of the mature trees, leaving enough trees to serve as a seed source and to provide the right amount of shade to produce a new generation of trees.

Clearcut harvests remove most or all trees in one timber harvest. Regeneration of the next stand occurs from natural seeding by nearby trees, planting seedlings, from stumps that sprout new trees, or from seedlings already growing in the understory.

Intensive Forest Management Practices or "high-yield" forest practices are used by some landowners in order to improve the growth and future timber yield of young forest stands. The goal of high tree growth is reached by favoring a limited number of individual trees. These forest practices resemble crop agriculture more than any other.

Two non-scientifically based timber harvesting methods are high grading and liquidation harvesting. They are not favored by forestry professionals, since they do not create sustainable forest conditions or enhance forest ecology.

High-grading is the harvesting of higher value, better growing trees while leaving inferior trees behind to occupy the land. Repeated high-grading can slowly, almost imperceptibly, degrade the quality of a stand. This is often mistakenly referred to as a "selective cut" by those who practice it or by those who do not recognize the difference between the scientifically sound selection harvest method (*which leaves healthy trees with diverse ages*) and high grading (*which takes the best and leaves weak, diseased or economically undesirable trees*).

Liquidation harvesting is generally viewed as inconsistent with accepted scientifically based forest management. It is often a speculative practice preceding hasty subdivision of land, and is characterized by a lack of regard for the continued long-term use of a property as productive forest land.

Both high-grading and liquidation harvesting fail to meet any definition of good forest practices. Their use reduces both the quality and productivity of the forest for

long periods of time — often several decades. The resilience of Maine's forests prevent such practices from having a permanent impact on forest productivity and quality, but the periods during which the forest is degraded has biological, aesthetic and environmental costs and may have economic costs as a result.

Wildfire Prevention

Forest fires can be devastating. Forest fire potential is higher in areas with many standing dead trees (*particularly conifers*) and in places frequented by human activity, such as near developments and along transportation networks. National fire prevention guidelines for wide expanses of lawn between houses and woods, however, are less important in Maine than in other parts of the country. It is more important, overall, to manage for a healthy, well-balanced forest and to have proper access routes for emergency vehicles than it is to create large, cleared fuel breaks which may compromise water quality and wildlife habitat.

Residential development in forested areas should include an assessment of forest fire potential, and incorporate fire prevention into house design and home site location. For example, a house located down a narrow driveway in a spruce and fir forest would be at risk for two reasons: (1) evergreen conifer trees are more likely to carry a fire due to the flammability of their resin, and (2) if a fire did start, emergency vehicle access would be difficult or impossible due to the narrow driveway. Guidelines for incorporating fire safety into real estate development are available from the Maine Forest Service.

Ecological Considerations for Municipalities

Water Quality

Water quality is a key indicator of forest ecosystem health and forest sustainability. Forests adjacent to waterways moderate water temperatures, filter sediments and contaminants, stabilize shorelines and contribute nutrients to support aquatic food webs. In the last thirty years, Maine developed a strong public policy framework for protecting

What can the towns do to protect water quality?

Let the forest grow. Consider not mowing the grass right up to the water's edge.

Control point source pollution.

Maintain riparian forested buffers wide enough to filter sediment from surface runoff.

Encourage landowners to let tree canopies grow over the stream banks, thus maintaining natural stream temperatures.

Leave woody debris of natural origin in streams.

water quality from degradation by all uses, including forest management. Landowners and municipalities should familiarize themselves with applicable policies, including: the Natural Resources Protection Act, mandatory Shoreland Zoning in organized towns and voluntary Best Management Practices for timber harvesting and logging road construction.

Well planned forest management activities not only protect water quality, but enhance it. The link between forest management and water quality has been a basic foundation of scientific forestry for over a hundred years. Substantial progress has been made over the last two decades to improve road construction techniques and timber harvesting technology. In spite of this progress, improvements to protect water quality are still necessary. Forest management activities around all surface water, including small brooks and streams, should be conducted in accordance with Best Management Practices and similar approaches to water quality protection.

Riparian Forest Buffers

It is important that those involved in town planning are aware of the importance of riparian zones, since proper management can protect water quality and reduce stormwater run-off. Located adjacent to water bodies and wetlands, riparian zones are the gradual transition zones from the mid-stream area to dry upland areas. Overall, riparian zones frequently contain the highest numbers of plant and animal species found in the forest.

Riparian buffers, a component of the larger riparian zone, are the vegetated areas beside streams, brooks, rivers and other wetlands. The plants, trees, shrubs and tall grasses growing in these areas buffer water from eroded soil, fertilizers, or toxic chemicals. Some pesticides can be transformed into nontoxic forms during the filtering process provided by buffer vegetation. Roots of buffer vegetation also help stabilize soil and absorb water.

In addition, riparian forest buffers regulate water temperature,

provide critical nesting habitat and travel corridors for wildlife, and provide food for fish and other aquatic life. As much as 75% of the food base in small, well-shaded streams is supplied by dissolved organic debris derived from fruit, limbs, leaves and insects that fall from the forest canopy of the riparian buffer into the water.

Wildlife Habitat and Biological Diversity

Until the last decade, wildlife conservation efforts concentrated on conserving specific wildlife habitat areas for game species (such as deer) and for endangered species (such as bald eagles). The focus on protecting or managing an area for one species shifted in the last few years towards protection and management for biodiversity values. The emphasis on biodiversity means that wildlife management tends to focus on conserving habitats for a variety of species.

What is Biodiversity?

Biodiversity represents a broad range of ecological values, including ecological processes as well as different species and habitats.

Biodiversity management favors the overall ecosystem instead of favoring particular species or habitats.

Managing for biodiversity protects many species (including those that are obscure, unknown, or inadequately studied) before they become threatened or endangered.

Effectively maintaining biodiversity includes taking environmental values such as air and water quality into account.

Larger geographic areas need to be considered in order to effectively manage ecological processes. Green travel corridors, for example, are important for wildlife that need larger habitats; they can use the corridors to travel between isolated habitat areas.

— *Biodiversity in the Forests of Maine: Guidelines for Land Management. 1999.*

The Shifting Mosaic Project, a model for managing industrial forest land for both economic and ecological goals, was established by the Manomet Center for Conservation Sciences in 1995. As the project grew, partnerships were developed with the University of Maine, state natural resource agencies, conservation organizations and other entities across the country. A team of independent scientists and foresters are working in two study sites to test new ways to integrate the economic goal of sustained wood supply and the ecological goal of sustaining populations of all plant and animal species in the working forest.

There is an opportunity to incorporate new knowledge into day-to-day forest management activities as new understanding of forest dynamics emerge. Both timber management and habitat management are built on natural changes that the forest undergoes — trees grow and habitats change when they do. Together, landowners and forest and wildlife managers

are working to find the common threads of protecting habitat while promoting timber productivity.

Soil Productivity

Protecting and, where needed, increasing soil productivity is important in maintaining healthy associations of soil flora and soil fauna. Soil is the foundation of the forest and the millions of invertebrates and fungi play an understated but crucial role in the flow of nutrients that lead to healthy trees and forests. Sustaining soil productivity requires maintaining proper soil structure, texture, organic matter and adequate soil nutrient levels. Improper timber harvesting significantly affects soil properties, including nutrient cycles and soil structure, while forest management practices that maintain soil nutrient cycles and structure also protect other natural resource values.

Healthy soil can be maintained by minimizing erosion into waterways during timber harvests, minimizing soil compaction by using logging equipment when the ground is hard or frozen, and leaving woody debris (*like logging slash*) on the forest floor to decompose back into organic soil matter.

Issues Facing Private and Municipal Forest Land Owners

Forest Fragmentation

Breaking up of sizable blocks of forest, or forest fragmentation, occurs due to residential development in the woods and from timber harvest practices that divide forested landscapes into smaller isolated habitats. Fragmentation is an issue of statewide concern in the public discussions about suburban sprawl, forest practices and conversion of shore frontage.

Many people now choose to live on forested parcels with the intention of having their forest land serve as an aesthetic backdrop to their residence. Two, three, even five acre lot sizes contribute to forest fragmentation. It is difficult to manage a woodlot less than 25 acres in size for timber values. Smaller blocks of forest, no matter how attractive, also tend to provide inadequate habitat for many species of wildlife with large territories or specific habitat requirements.

Forest Fragmentation in Maine:

The average acreage size of privately owned woodlots is steadily declining.

Forest management opportunities tend to decline as woodlot sizes decrease.

Public values such as traditional recreation access, biological diversity, forest productivity and forest-based employment suffer as woodlot sizes decrease.

Access for Public Recreation

Maine's private landowners have a long history of providing forest recreation opportunities to the public. Nearly all of the large industrial and non-industrial forest lands remain open to traditional activities such as hunting, fishing, trapping, hiking, snowmobiling, camping and birdwatching, as well as newer activities like mountain biking and ecotourism. This tradition of free and open public access continues, despite pressures to generate revenue to lower the annual

carrying costs of owning forest land. Many of the smaller forest ownerships remain open to responsible recreation, although changing landowner attitudes have led to a decline in public access in the southern half of the state.

State and private programs and policies designed to encourage landowners to keep their lands open and available for public recreation are generally regarded as success stories that other states could do well to copy. These success stories include the Great Ponds Act, landowner liability laws, and the Tree Growth and Farm and Open Space tax laws (*which allow for, but do not require, public access*).

The challenge for the future will be to maintain an ongoing dialogue between forest landowners, forest users, municipalities and public agencies, with coordinated actions designed to reduce conflicts and maintain the long tradition of reasonable public access to private lands.

State Laws to Know Before Cutting Trees

State conservation laws are designed to protect water quality and forest health. Laws change occasionally, so it is a good idea to call the Department of Environmental Protection, the Land Use Regulation Commission and the Maine Forest Service to get updates on current changes before cutting trees or moving soil. Local forestry, street tree and conservation ordinances may exist and can be stricter than state laws. If no local regulations exist, then state laws still apply. It is useful for municipal officers to be informed about these laws and to provide information about them to interested citizens. A booklet titled *A Field Guide to Laws*

Pertaining to Timber Harvests in Organized Areas of Maine (available from the Maine Department of Environmental Protection or from the Maine Forest Service) outlines the five laws in more detail. A booklet titled *Best Management Practices: Field Handbook* (available from the Maine Forest Service) is a how-to guide for on-site erosion control.

Five State Laws

***Protection and Improvement of Waters Law* (Title 38 MRSA, Chapter 3)**

Protects waterways from pollution by soil runoff that can occur during home construction, road construction, logging, or any similar activity that have potential for causing erosion.

***Erosion and Sedimentation Control Law* (Title 38 MRSA, Chapter 3, Subchapter 1, Article 2)**

Regulates moving, filling, or exposing soil. Forest activities, such as road building, must comply with Land Use Regulation Commission standards. Alternatively, use and maintenance of proper erosion control devices during times of soil disturbance and permanent soil stabilization afterwards is permissible. This law is enforced by the Department of Environmental Protection and can be enforced by the local Code Enforcement Officer.

***Natural Resources Protection Act* (Title 38 MRSA, Chapter 3, Subchapter 1, Article 5-A)**

Regulates any work done in, over, and next to any body of water and other protected natural resources (*including dunes, marshes, tidal areas and other wetlands*) that

involves disturbing soil, placing fill or building permanent structures. Also applies to mountain areas over 2,700 feet in elevation.

***Shoreland Zoning* (Title 38 MRSA, Chapter 3, Subchapter 1, Article 2-B)**

Regulates activities within 75 feet of streams and within 250 feet of ponds, lakes, rivers, tidal areas and freshwater wetlands. Town zoning may be even more restrictive than state regulations. All areas of the state are subject to shoreland zoning. Code enforcement officers usually enforce shoreland zoning locally, but contact the Department of Environmental Protection for guidelines if it is difficult to obtain information from local sources. A law that took effect in January 2000 directs the Maine Forest Service to develop consistent statewide rules regulating timber harvesting in shoreland areas by January 2002. The rules must be approved by the Legislature before they take effect. The law also authorizes the Legislature to propose modifications to consolidate, clarify and resolve inconsistencies in the water quality and shoreland zoning laws. Contact the Maine Forest Service for up-to-date information on these changes.

***Forest Practices Act* (Title 12 MRSA, Chapter 805, Subchapter 111-A)**

Regulates the size, arrangement, management and regrowth of clearcuts.

More About Maine's Forest Practices Act

Maine's Forest Practices Act (FPA) was enacted in 1989. The Maine Forest Service developed and implemented regulations to enforce the FPA. The law is organized into three broad areas: (a) regulation of clearcutting, (b) reporting requirements and forest assessment and (c) technical assistance.

Relationship to municipal rules and regulations

Municipalities may adopt their own timber harvesting regulations. The Forest Practices Act requires that municipalities use definitions for forestry terms that are consistent with definitions in the Forest Practices Act. Contact the Maine Forest Service for a complete definitions list. A municipality must also follow the process outlined in the Forest Practices Act for developing and adopting a timber harvesting ordinance.

Reporting requirements and forest assessment

Under authorization of the Forest Practices Act, the Maine Forest Service collects annual data on timber harvesting, other forest management activities, and the import/export of forest products. This data is used by the Maine Forest Service to provide reliable and timely information about the condition of Maine's forest resources and how they are used.

Landowner Notifications:

Landowners must notify the Maine Forest Service before starting timber harvesting operations. Information provided by the

landowner includes location of harvest, dates of harvest and anticipated acreage to be harvested. A landowner is exempt from the notification requirement if he or she is harvesting timber for their own personal use, or is harvesting a small acreage (*less than 2 acres if a clearcut, and less than 5 acres if not a clearcut*).

Information in the Forest Operations Notification, which includes the location of the harvest and its estimated acreage, is useful to the Maine Forest Service in enforcing the Forest Practices Act and other environmental regulations. Notifications are provided to all municipal clerks. Some municipal code enforcement officers use them to determine where timber is being harvested in the municipality.

Landowner Reports - Confidential Report of Timber Harvest:

Any landowner who conducts a commercial timber harvest must report to the Maine Forest Service the following: species harvested, the volume harvested, stumpage prices received, location and size of harvest and timber harvesting methods used.

Wood Processors and

Importer/Exporters: Sawmills, paper mills and other manufacturers that process timber must submit annual reports to the Maine Forest Service that detail the amount of timber processed (*broken down by species*) and the county where the timber was harvested. In addition, any individual or firm that imports or exports forest products must provide an annual report on the origin of the forest products and their destination.

The Maine Forest Service

Regulation of clearcutting

The Maine Forest Service regulates the size, placement and management of clearcuts. The general requirements are:

Landowners must prepare a harvest plan for any clearcut larger than 20 acres. The plan must be signed by a Maine Licensed Professional Forester. Clearcuts can only be conducted for silvicultural or wildlife habitat reasons.

For clearcuts larger than 75 acres, a landowner and the Maine Forest Service must conduct an on-site review of the harvest plan and the Maine Forest Service must make a written determination before the harvest begins.

Clearcuts may not be larger than 250 acres.

Adjacent clearcuts must be separated from each other by at least 250 feet.

Clearcuts over 20 acres must have a separation zone equal in area to the clearcut.

Landowners must ensure adequate regeneration (new tree growth) within 5 years of clearcutting.

Landowners who own less than 100 acres are exempt from the rules on clearcut size, placement, and harvest plans, but are still responsible for meeting regeneration and reporting requirements. Due to the complexity of the rules, private and municipal landowners should consult with a Maine Licensed Professional Forester before creating a clearcut. Contact the Maine Forest Service for more information.

compiles timber harvest data to produce reports on annual volume of timber harvests in the state to determine average statewide stumpage prices for trees “on the stump”. The information is also used to analyze timber supplies, future demands for forest resources, trends in how forest resources are used and other special reports. Information reported by landowners and wood processors is confidential.

The Maine Forest Service is able to provide information on wood harvesting trends to individual towns on request. Some towns have used this information in their comprehensive planning process.

Technical Assistance

Maine Forest Service field foresters and specialists are available to provide technical assistance to municipalities, forest landowners and individuals. Assistance is provided through workshops, field demonstrations, media presentations and through participation in grant programs (*including Forest Stewardship, Community Forestry and Rural Development through Forestry*).

Tracking Conditions and Changes in the Maine Forest

The Maine Legislature authorized and funded annual forest inventories and forest assessments. Data collection combines remote

sensing and on-the-ground inventory of forest study plots. In partnership with the USDA Forest Service’s Forest Inventory and Analysis program, twenty percent of Maine’s forest will be inventoried annually, with a full assessment cycle completed every five years. The first full assessment is due in 2004. The forest assessment program significantly improves scientific knowledge of natural changes and timber harvest activities — information that will provide future guidance to those involved in natural resource management decision making at the municipal level.

Land Conservation and Protection Options for Private Landowners

Climbing real estate prices and property tax assessments in recent years make it increasingly difficult for landowners to hold onto family woodlots. As a result, many landowners are forced to sell their property because of high taxes or other economic pressures. Several conservation strategies that are available to help landowners conserve precious green spaces also make economic sense for municipalities.

Current Use Property Tax Programs

Maine's Current Use Tax programs include the Tree Growth Tax Law and the Farm and Open Space Tax Law. These programs help landowners retain ownership by assessing the land for current use (*e.g., growing trees or farming*) instead of for development potential. In many cases, the difference between taxes owed under current use assessment versus fair market is so great that current use assessment allows landowners to retain ownership of property they would otherwise not be able to keep. Municipalities are reimbursed by the state for the difference in tax revenue.

Tree Growth Tax Law

Any Maine landowner who owns ten or more acres of forested land is eligible to enroll in the Maine Tree Growth program if the land is classified as forest land. Under the program, landowners must manage the forest on a "commercial" basis. Since land is being valued on a forest land basis, tax savings may be substantial for the landowner.

While the valuation of the land is based on the productivity of that land for growing timber, each town uses its own tax rate to determine the amount of taxes owed on the property. The valuations per acre are set by the State Tax Assessor's office by county and are based on the value of timber sold in the county during the previous three years and on the locally determined rates of tree growth.

If timber harvesting is recommended by the licensed professional forester who drew up the forest management plan for the property, then harvesting is necessary to participate in the program. There are no requirements that a certain percentage of a woodlot be harvested annually, or that a minimum number of cords or board feet be harvested. If a recommended harvest is not con-

ducted, however, landowners participating in the program run the very real risk of having their land removed from Tree Growth Tax classification and paying a tax penalty that can be substantial.

For more information, contact the Maine Forest Service: 1-800-367-0223

Farm and Open Space Tax Law

The Farm and Open Space program allows for the valuation of land based on its current use as farmland or open space, rather than its potential fair market value.

Farm Land

Similar to the Tree Growth program, this law values farm land based on soil types, commodity values, farmland rentals, topography and other factors. The minimum size for enrollment is five contiguous acres and the land must be used for farming, agriculture, or horticultural activities, but woodlands may be included within the farm unit.

For more information, contact Maine Bureau of Revenue Services. (207) 287-2011

Open Space

The Open Space program reduces property taxes on properties that offer public benefit. Public benefits include preservation of scenic vistas, wildlife habitat protection, or public recreation. There are no minimum acreage requirements. Assessed values are reduced by set percentages depending upon the degree of permanent protection easements and the benefit to the municipality.

Rate reductions:

- ▶ Ordinary open space is eligible for a 20% reduction in assessed value.
- ▶ Permanently protected open space is eligible for an additional 30% reduction in assessed value, or 50% off the standard value.
- ▶ Forever wild open space is eligible for an additional 20% reduction in assessed value, or 70% off the standard value.
- ▶ Public access open space land is eligible for an additional 25% reduction in assessed value, or 95% off the standard value.

For more information, contact Maine Bureau of Revenue Services. (207) 287-2011

Conservation Easements

Conservation easements allow landowners to permanently protect natural and scenic resources while retaining ownership and control of their properties. An easement is a legal agreement between a landowner and an easement holder (*such as a land trust*), that is tailored to fit a particular property. It is legally binding for the present landowner and all future owners, and is recorded in the county courthouse as a legal document. A key component of conservation easements is that the landowner retains ownership with the right to control and manage the property within the guidelines of the easement.

Key Features of Conservation Easements:

- ▶ Landowners often qualify for tax benefits.
- ▶ It is not a requirement to allow public access.
- ▶ Landowners retain the title to their property.
- ▶ Each easement is specifically tailored to reflect the conservation goals of the landowner and the holder of the easement.
- ▶ Conservation easements are given in perpetuity and become a permanent part of the title to the land, regardless of future ownership.
- ▶ Activities allowed depend on the landowner's wishes and the characteristics of the property.
- ▶ Conservation easements may be designed to cover all of the property or only a portion of it.

For more information, see the Additional Resources section at the back of this guide.

Land for Maine's Future Program

The Land for Maine's Future (*LMF*) program was established when Maine voters approved a bond for purchasing lands for recreation and conservation purposes. The program allows for public acquisition of private land at fair market value in order to protect natural and recreation values. Lands that provide public access to water are a high priority in the program, but other lands are eligible. The land may either be purchased outright by the state, or development rights may be purchased and held in a conservation easement. Any individual, municipality, or group can submit a proposal to the LMF Board, but the proposal will only be considered if the landowner is willing to participate. Purchased LMF lands may be managed by the municipality under LMF program guidelines.

The LMF program also mandates the protection of farmland from development by purchasing development rights from farm owners. Individual farms may apply.

For more information, contact the Land for Maine's Future Program at (207) 287-3261, or on the internet at www.state.me.us/spollmf.

Guidelines for Including Forest Land in the Comprehensive Land Use Plan

Forest Land Conversion:

Tracking where growth is occurring in your town may be your most important tool in determining the future of forest land within town boundaries.

Is forest land being converted to residential or other land uses? Check subdivision and building permits for the last 5 to 10 years to quantify the amount of activity on recent farm and forest lands. Locate new development on a map, preferably a zoning map. Is this trend likely to continue? Is most of the development occurring in the designated growth areas, or is it spread out across the rural areas of town? The analysis should also include an inventory of land uses around existing farms and commercial forest land and an assessment as to whether these are compatible uses. Incompatible uses typically include residences, strip commercial activities and commercial/industrial uses that are not serving forestry operations.

This section of the guide focuses specifically on the comprehensive land use plan. Development or revisions of a comprehensive plan can be daunting for volunteer committees that are just getting started, but assistance and guidance is available from several sources, including your regional planning council (*see Part Four*). Discussions with comprehensive planning committees or conservation commissions from other towns about what obstacles they faced and how they proceeded can provide valuable guidance for a fledgling comprehensive planning effort.

Planning committees should give some thought to the role each member will play. Will the committee coordinate work that will be done by an outside contractor (hired with assistance from a regional planning council), or will members look to complete all the work themselves? If so, how will this be accomplished? A discussion about what needs to be accomplished and how the committee should go about it may keep the process from getting bogged down.

The inventory and analysis stages can be time consuming and deplete valuable energy if committee members try to do all the work themselves. Consider working with a regional council or with volunteers (*see Importance of Educating the Public, below*) on inventory tasks. The inventory guidelines provided in Part 2 of this publication will serve as a guide for what to consider — even if the actual inventory work is not done by committee members.

Policy Development and Implementation are more con-

tentious than collecting data, but completing them is essential for the plan to be effective. Often the comprehensive planning effort stops when the inventory is finished, but it is not enough to identify problems; the committee must move on to the solution and recommendation stages of planning. In addition to the guiding questions offered in this publication, seek out guidance from sources mentioned here and refer to the Additional Resources section for information on topics of specific concern. Keep in mind that there is no one-size-fits-all model comprehensive plan for a municipality. Each town is different, even though they may share similar concerns, so each town must craft a unique comprehensive plan that is flexible enough to guide land use policy effectively and strong enough to uphold the land use values held by the majority of the community.

The Importance of Educating the Public

Involving citizens early in the process of developing a comprehensive plan is a crucial, and often overlooked, part of the planning process. Too often, municipalities wait until well into the process and use only one outreach strategy (*such as public meetings*) to get public input. The result can be a poorly supported comprehensive plan that fails at the vote or is adopted but then put on a shelf and ignored.

An outreach strategy need not be complicated, but one person on the committee should be responsible for coordinating it so it is not overlooked.

Simple education outreach strategies include:

Citizen Input

Recruit teachers and their students, local bird watching and garden clubs, and other citizen groups to complete one specific aspect of the natural resources inventory in their area of interest. Their effort will provide valuable data, encourage them to care about the planning process and get them talking to other community members about the planning effort. Don't lose track of them when the inventory is finished. Invite them to provide input during the Policy and Implementation steps that follow.

Easy Newspaper Columns

Ask your local paper or weekly periodical if they will run a series of guest columns on natural resources and planning. Excerpts from this publication or from the Maine Forest Service publication *The Woods in Your Backyard* can be used verbatim, as long as the Maine Forest Service is credited. For example, a scenario from Part 1 of this guide could be split into three pieces, with one piece published weekly along with a couple of introductory sentences that make the information relevant to the local comprehensive planning effort. The Maine State Planning Office may also be able to provide publications to excerpt.

Surveys

Survey town residents to see what land use values are important to the majority. See *Development of a Comprehensive Plan in a Southern Maine Town* in this publication (see table of contents) for a creative example that resulted in a

high return rate of surveys and a publicly supported comprehensive plan.

Workshops

Work with your regional planning council to bring in experts to talk on misunderstood topics such as conservation developments, cluster housing, forestry and natural resources and economics.

Videos

Book a night on your library speaker series to introduce topics such as how forests, natural resources, economics and subdivision planning fit together. Contact the Maine Forest Service to borrow videos on *What Do Trees Have To Do With It? Forestry and Planning* and *Growing Greener: Putting Conservation into Development Design*.

Focus Groups

Get several small discussion groups of less than twenty people each (*including people of varying viewpoints in each group*) to discuss a specific issue and propose alternatives. A trained, outside facilitator may be useful if the issue is contentious. A note keeper should be assigned in each group so a record of key points can be included in the Analysis part of the planning process.

Neighborhood Meetings

Small group meetings give citizens a chance to provide input during the policy development stage rather than react to a nearly finished plan. One possibility is to recruit the contacts made with birding and garden clubs to see if individual members are willing to host a neighborhood potluck followed by an information and dis-

cussion meeting run by members of the committee. Invite those with a wide range of views. Again, assign a note taker so the discussion is recorded.

Public Hearings

An effective moderator who keeps discussion focused is crucial for an effective larger meeting. If other public outreach efforts are already well underway, attendance at the larger public forum will be greater and less contentious.

Inventory and Analysis

Careful and thorough analyses provide planning committees with an understanding of their town trees, local forests, important ecological areas, development trends and the condition of forest land within municipal boundaries.

Some data can be collected at town offices, county offices and state and federal agency offices, but local resources are also extremely important. Local forest products industries, hunting and fishing clubs, homeowner and camp owner associations and local landowners can provide a wealth of information about changes in land use that will help identify current trends. Analysis of development trends is critical for gaining an understanding of threats to forest land as well as providing insights for strategies to address the threats.

Some of the inventory can be conducted by those without forestry training, but it would be useful to have a licensed professional forester to assist in gathering and analyzing information, and identifying trends in future land use. If a forester is not a member of the group that is collecting data

Questions for Forest Land Owners

Questions a committee member might ask a forest land owner:

What is it like to own and manage forest lands in this town?

How does development affect your lands and operations?

What could the community do to make it easier for forest land owners and managers to keep their land in forest production?

What would heirs likely do with the land?

What types of products do you manage your lands for?

Where are the markets for your forest land products?

for the comprehensive plan, contact the Maine Forest Service for information on how to retain a licensed professional forester in your area.

The Study Area Map

Most of the information collected during the inventories can and should be organized on a map. Current land use trends and potential land use changes are easier to spot on a map. If Geographic Information System (GIS) services are available to your municipality, GIS maps are especially useful, since data sets can be layered by selection. Soils, wetlands, roads, utilities, schools and other municipal features can be selected and easily viewed in any desired combination on a GIS map.

While not as versatile, synthesizing data on a non-computerized base map will effectively illustrate land use. A 7.5 minute US Geological Survey (USGS) map serves as a useful base map since it shows topographical features like hills, valleys,

Inventory of Existing Forest Land Use

STEP 1 *How Is Your Forest Land Used? Identify the Following Uses in Your Municipality.*

Managed Forest land — Forest lands primarily devoted to forest management and the periodic harvest of timber on a commercial basis. This could be a sub-category of all timberland, including unmanaged forest land. These lands may also support recreational use.

Recently Converted Forest Land — Record forest land recently (*within the last 5 years*) converted to other uses.

Wildlife Habitat and Biologically Significant Areas — Include forest lands identified as important or protected wildlife habitat areas or critical natural areas by the Maine Department of Inland Fish and Wildlife and/or the Maine Natural Areas Program.

Permanently Protected Forest Land — Identify forest lands under permanent protection (*such as conservation easements*). Separately identify those that do and do not allow forest management.

Regulated Forest Land — Identify forest lands where the allowed uses are regulated by state law or local ordinance in order to protect specific natural

resources (*e.g., shoreland protection zones around lakes and rivers and riparian zones near streams*).

Designated Open Space — Lands designated as open space may be owned or managed by the municipality, county, state, or a not-for-profit organization. They also may overlap with other categories of land use.

Recreation and Scenic Areas — Identify forest lands occupied by parks, public campgrounds, trail systems, etc. and any locally important scenic vistas or viewsheds.

Non-Timber Forest Products — Forest land managed for maple syrup, ginseng, mushroom cultivation, woodland herbs or other forest products fall under this category. Balsam tips and other products also should be accounted for when it is possible to obtain information about them.

Commercial Non-Timber Uses — Forest lands where the primary use is commercial, but non-timber oriented. Examples include commercial campgrounds and hunting preserves.

Municipal Water Supply Protection — Forest land that surrounds and protects municipal water supplies and acts as a water recharge area.

Municipal Special Use — Forest land that is partially or completely converted for special municipal

streams, marshes and related elevations. Most major and some minor roads, power lines, bridges, houses and forested areas are also on USGS maps, but accuracy of these features depends on when the map was last updated. Many USGS maps have not been updated since 1959, and many roads and houses have been built in the intervening forty years. Forested areas have either grown up or been cut down. Older prominent community buildings or landmarks on a USGS map can be used as reference points to orient the viewer if they are labeled. New roads and other changes can be added as needed.

USGS maps are available from local outdoor stores or from the

Maine Geological Survey. It may take more than one map quadrangle to cover your municipality.

A city or county road map is another alternative, but lacks the topographic features and infrastructure details found on the USGS maps.

As inventories are completed, data that can be directly related to specific areas of the municipal landscape should be recorded on the map. Sets of landscape data can be separated by adding each type of data to a transparent mylar sheet that can be layered over the base map. Some mylar separates with streams, roads and other landscape features are available from the Maine Geological Survey. Using different colored markers

for each data layer makes information easier to interpret.

Inventory of Existing Forest Land Use

The inventory should include the current use of forest land: what it is, where it is, and what current impact it has on the town. Data that can be illustrated in map form should be recorded on the base map. It may prove useful to record all data in tabular form or in narrative form for future reference in the Analysis and Implementation phases of the process, or to refer to when presenting the mapped information to the public. The State Planning Office's Comprehensive Planning Manual lays out the basic steps for con-

uses, such as a sewage treatment lagoons and spray dispersal of treated sewage.

STEP 2 *Map Different Forest Use Areas*

Enter data into the GIS program or draw in the boundaries of different land use areas on your base map, or on mylar separates that can be layered over it.

Where to Get the Information

Maine Forest Service 1-800-367-0223 Provides information on forest lands under the Forest Stewardship Program and on forest regulations. Can provide summary information on timber harvesting activity in the area as a whole.

Maine Department of Inland Fish and Wildlife (207) 287-8045 : Provides information on wildlife habitat, including maps of significant and essential wildlife habitat.

Maine Natural Areas Program (207) 287-8044: Provides information on the location of important natural features.

Town or City Office: Provides information on forest land enrolled in the Tree Growth Tax Law program

and on tax exempt lands (e.g., *The Nature Conservancy land or church-owned land*). Tax maps show state, county, or municipally owned land. The assessor also keeps records on Farm and Open Space.

Maine Department of Conservation/Bureau of Parks and Lands (207) 287-4905: Will provide information on state-owned public land in your area.

Maine Coast Heritage Trust (207) 729-7366: Will be able to answer questions regarding conservation easements and can provide a Land Trust Network list that has all land trusts in the state. Your closest land trust should be able to help you identify many properties under conservation easement.

Non-Timber Forest Products: No centralized source of information exists. Local contacts may know who is actively cultivating or harvesting products. Contact local loggers, hiking or bird watching clubs, local Cooperative Extension offices and farmers markets to find out who is growing, harvesting and selling non-timber products.

Maine State Planning Office (207) 287-3261: The booklet *Comprehensive Planning: A Manual for Maine's Communities* offers additional guidelines on how to collect local information.

ducting the inventory and analysis of forest lands and forestry resources, which includes: a) Identify the resource base (*soils, land cover, etc.*); b) Inventory commercial forestry activity; c) Identify ownership patterns; d) Identify related activities (*e.g. Biomass boilers, mills, etc.*); e) Assess the contribution of forestry to the local and, if applicable, regional economy; f) Analyze how land use trends may be affecting, or in the future are likely to affect, forest operations and forest land ownership; and g) Identify trends

affecting the long-term viability of existing forest operations.

A more detailed listing of items the committee may wish to consider follows.

Analysis of Existing Forest Land Use

Analysis of the inventory data will reveal general trends in recent land use that will help the town foresee what is likely to happen in the next ten years. The following questions should help encourage dialogue that will lead to creating effective land use policies.

Forestry Activities — Once commercial forest land is inventoried, the analysis should include future trends. Is forest land being converted to other uses? Will it continue? At what rate? Are land uses adjacent to existing forest lands compatible with forest management? Are abandoned farms and fields being allowed to revert to forests? Will parks, open-space and campgrounds remain the same size, expand, or decrease?

Existing Regulations and Zoning — Do existing regulations or zoning encourage or inhibit

Inventory of the Local Economy

STEP 1 *How do Forests Contribute to the Local Economy?*

Forest Products Industry — Identify pulp and paper mills, sawmills, bolt mills, veneer mills, burners or biomass fuelwood processors and other forest products industries in your study area. It would be helpful to know their resource requirements, number of employees, payroll, taxes, etc. It is also important to consider forest industries beyond town boundaries since they often rely on wood suppliers and provide employment to adjacent towns.

Employment — Determine how many men and women work in the woods harvesting trees. Local licensed professional foresters that manage private forests should also be counted.

Non-Timber Forest Products — The contribution of non-timber forest products (*e.g., maple syrup, woods-grown mushrooms, medicinal herbs, balsam fir tips, etc.*) to local economies is worth trying to determine, but may be difficult to measure.

Commercial and Noncommercial Recreational Areas — Forested recreation areas located in or near a municipality attract visitors who shop at local retailers and eat at local restaurants.

Hunting and Fishing — These may also be important economic activities related to forest land in your area. If development patterns are resulting in rural lands being broken up into residential lots,

is this diminishing the hunting and fishing opportunities in your community?

STEP 2 *Tabulate Data*

Organize the data in table form, including numbers of people employed in each category, number of visitors and local revenue associated with each category where that data is available.

Where to Get the Information

Maine Forest Service 1-800-367-0223: Provides information on forest products and on mills. District field foresters can provide information on loggers and foresters in the area.

Individual Companies: Provide information on the number of employees, payroll and income generated.

Department of Conservation/Bureau of Parks and Lands (207) 287-4905: Provides information on number of visitors to state parks and recreation areas.

Non-Timber Forest Products: No centralized source of information exists about who or how many people cultivate or collect non-timber forest products. Contact local loggers, hiking or bird watching clubs, local Cooperative Extension offices and farmers markets to find out who is growing, harvesting and selling non-timber products.

sound forest management? Is the development that is occurring in town being directed effectively by existing local policies, programs and ordinances? In many Maine towns, the majority of new homes are located in rural areas and, if the trend continues, more and more larger forested tracts will get subdivided and taken out of forest products production. Is this the trend in your town? If it is the trend, is it the desire of the town to encourage and maintain the forest land resource and forest based economy?

Commercial Use — Will current commercial uses remain the same, decrease, or expand? Are new commercial enterprises in the planning stages? Are current trends good for the town or should they be redirected?

Inventory and Analysis of Forestry Activity in the Local Economy

After collecting the inventory data and organizing it so it is easily readable, consider the following questions:

- ▶ Is there sufficient land available to meet the other goals and trends that have been identified?
- ▶ What can the town do to encourage better forest management that balances economic values (*direct values such as income from forest products and indirect values such as a reduction in costs associated with stormwater run-off; for example*) and environmental values (*such as water quality improvement, wildlife habitat protection, soil conservation and recreation*)?
- ▶ Does the town want to encourage more forest recreation in the area? How can that be achieved in an environmentally friendly way? What strategies might help pre-

serve these opportunities? For example, is establishment of a local recreation committee an option?

- ▶ How can the town promote wildlife habitat protection? For example, is a local or regional land trust available to accept gifts or to purchase land or land development rights?
- ▶ Does the town want to encourage the production and marketing of non-timber forest products such as maple syrup or gourmet mushrooms? If so, how can forest-related entrepreneurship be encouraged?

Inventory of Important Natural Features Associated with Forest Land

Forests are not separate from the rest of the municipality. Identifying the following natural resources associated with forest land is essential to have the background information necessary for effective planning. Contact your regional planning council for assistance. The assistance of a licensed professional forester would also be useful.

Analysis of Natural Features

Forests are complicated ecosystems that grow slowly. They are also one of our few truly renewable natural resources. Without human intervention, our forests will perpetuate themselves forever. If we intervene in the natural process, we may obtain many goods and services while protecting the forest's ecological integrity, but a long-term outlook is necessary for effective and comprehensive forest management. What we do today significantly impacts the future forest.

To analyze forest-related natural resources consider the following questions:

- ▶ What are the needs of the town or region: more forest land, more wildlife habitat, more protection of the soil, water and air?
- ▶ Will forest lands meet these needs for the next 10 years? The next 50 years? The cycle of a forest extends far beyond traditional town planning cycles, so a “build-out” projection here (*based on current or planned growth trends and recent development patterns in the town*) will provide insight into future effects on the availability of forest values. Check subdivision and building permits for the last 5 to 10 years to quantify the amount of activity on recent farm and forest lands. Locate new development on a map, preferably a zoning map. Is this trend likely to continue? Is most of the development occurring in the designated growth areas, or is it spread out across the rural areas of town? The analysis should also include an inventory of land uses around existing farms and commercial forest land and an assessment as to whether these are compatible uses.
- ▶ Do forest industries in the town/region need help? What role should the town play?
- ▶ Do we need to help landowners manage public recreational use of their forest land?
- ▶ Are municipal street and landscape trees being maintained? Do we need to plant more street trees? Do we need to have more trees in residential developments?
- ▶ Do we need to encourage special forest management practices in riparian forest buffers, around aquifers and water discharge areas, near open water, along steep slopes and in other sensitive areas?
- ▶ Are there areas with highly erodible soils that require special attention?

Inventory of Important Natural Features Associated with Forest Land

STEP 1 *What are the Natural Features in Your Municipality?*

Age of Forest Stands — As a minimum the town should, using local knowledge, define those lands classified as commercial forest lands. Towns may want to work with a licensed professional forester to further classify the age and health of forests in order to identify potential effects on future supply of forest products, recreation options, safety, etc.

Topographic Features — Topographic features that affect forest management (*including steep slopes, rivers and stream beds, bogs, marshes and ponds*) should be identified. The “lay of the land” will affect a landowner’s ability to manage the forest and protect sensitive areas. Use of improper harvesting equipment on sensitive soils or areas (such as steep slopes) may result in unnecessary damage to the site and pollution of nearby waterways. It may also

cause unnecessary expense to the timber harvester or to the landowner who is required to repair the damage.

Soils — Prime forest soils as defined by the Natural Resource Conservation Service need to be identified and located. Productivity of forest lands are directly related to soil types, soil quality and depth.

Watershed Protection — In addition to lands specifically designated to protect municipal water supplies, identify forest land that is especially important for protecting water quality. Well planned and implemented forest management activities are far more protective of water quality and quantity than other land uses.

Wildfire Potential — Forested areas with forest fire potential should be identified. This includes areas with dead or dying conifers, windblown trees and homes or developments with inadequate road access for emergency vehicles to enter, turn around and leave the site during a fire. Do roads and driveways meet the minimum requirements for emergency vehicle access? (*All roads should be at least 16*

- What do we need to do to reduce wildfire potential and minimize damage if a wildfire starts? For example, do we need to require two escape routes from cul-de-sac development areas? Will road networks support fire suppression equipment at all times of the year? How can we encourage smart building and homesite maintenance to reduce risk?
- Do we need to provide buffers between the forest and incompatible land uses? If so, how?
- What do we need to do to encourage residential development in appropriate areas in order to protect forest lands?

Summarize Inventory and Analysis

The inventory and analysis of

forests and other important natural resources should be summarized. The maps, tables, narrative and, if available, GIS models, should provide a sound basis for developing well informed land use policies that incorporate local interests and goals. This is a good stage to review the level of public participation in developing or reviewing the comprehensive land use plan. The sooner the general populace is aware of and encouraged to provide input into the process, the more likely that the finished comprehensive plan will be adopted by town vote.

While the inventory and analysis stages of developing a comprehensive plan are essential, some of the hardest work is using that information to develop effective land use policy guidelines in

the face of conflict between stakeholders. Inventory and analysis is only the beginning. There will most likely be conflicts. And incompatibilities between different town objectives. For example, how will the forestry goal be fulfilled while fulfilling the need to provide affordable housing or recreational needs? These value conflicts will have to be resolved. Each component of the plan must be workable. Don’t give up. Prepare to compromise in the interest of a strong and workable comprehensive plan that can effectively guide your municipality into the future and stand up to opportunistic challenges to weaken it.

Plans that are developed should be in effect for the next 10 years; however, plans should be reviewed every two to five years to

feet wide to allow for easy entrance of fire trucks, dead-end roads should have a minimum turn-around radius of 60 feet, and bridges should be able to hold 30,000 pounds).

Street and Landscape Trees — Inventory street and shade trees with the assistance of the Maine Forest Service Community Forester or a local arborist. How many are there? Are they healthy? The important contributions provided by street and shade trees need to be recognized during the planning stage of community development, since they require regular care and maintenance to look good and stay healthy.

STEP 2 *Map Natural Features*

Add the components above to the map of your study area. If GIS is available for your data collection and analysis, this section lends itself particularly well to GIS data layers. Additional narrative on the age of forest stands and street and landscape trees will provide useful details that would be difficult to read on a map.

Where to Get the Information

Maine Geological Survey: (207) 287-2801. 7.5 minute topographical maps can be ordered for a small fee. Review the web site at www.state.me.us/doc/nrimc/mgs/mgs.htm

Maine Forest Service: 800-367-0223. Can provide information on community forestry, fire prevention and control, forest health and more. See Clip-n-Copy pages at the back of the guide for more information on programs and services.

Natural Resources Conservation Service: (207) 990-9100. Contact this general information number to be directed to the office in your area. The local office has soil maps and can provide a wide range of information on the connection between soils and land use.

Maine Office of Geographical Information Systems (OGIS): (207) 287-6144. Call with technical questions. For information about services and products offered, review the Web site at appollo.ogis.state.me.us/ogisper.asp

determine whether updating or revisions are necessary.

Guiding Questions: Policy Development for Forest Land Use

The comprehensive plan provides the background and framework for land use ordinances, so it is essential that natural resources and factors related to them (*e.g., economic, scenic, recreational, etc.*) be inventoried and documented. Once the inventory and analysis stages are complete, those involved in the development or review of the comprehensive plan have the opportunity to step back and look at the whole municipality. They also have the opportunity to take the long view and envision the future of the municipality five or ten years from now, given current

land use trends, current regulations and incentives.

Future land use trends can be represented by a map which “builds out” potential development on currently undeveloped forest land that could be developed under current codes, and a companion “build out” map that illustrates the goals and objectives of the comprehensive plan. This may include areas designated on the map as protected open space, commercial forest land, conservation developments and other areas. Forest Land needs to be considered in the context of other comprehensive plan features like traffic, sewage and storm water infrastructure, housing and economics.

Sufficient information should have been collected during the inventory and analysis stages to

identify municipal goals and objectives. When those steps are completed, current local codes (*or the lack of current codes*) can be assessed to determine if they effectively meet the desired goals and objectives and non-regulatory options explored.

Policies that come out of this process should encourage landowners to protect the forest without overburdening them. Policies in one town should complement those in adjacent towns as much as possible, since what happens in one town will affect neighboring towns. One way to facilitate policy development across town boundaries is to work closely with regional planning commissions.

Policies promoting resource conservation and sustainable uti-

lization will help direct the course of municipal planning during the next ten years. While policies must address the state goal of protecting forest land from inappropriate and incompatible development, they also come directly from the analytical work considered earlier.

As you draft forest land use policy, keep in mind that many local comprehensive plans recognize the importance of forest land, but few effectively protect it. According to the Maine State Planning Office, there are several reasons for this:

First, the notion that a rural landscape is a working landscape has been lost in many areas of the

state. Instead, the definition of a rural landscape is one with enough trees or fields to create some distance between neighboring houses. Large lot residential zoning has been adopted by many towns as the least controversial way to retain a “rural” feel. By doing this, towns have unintentionally promoted a sort of wooded suburban sprawl by requiring two, three, or five acre minimum lot sizes. Large lot sizes fragment forest land — a process with a host of ecological, environmental, aesthetic and economic impacts outlined in Part One and Part Two of this guide.

Second, farms and working forests need acreage to be viable.

While estimates vary, 25 acres is the size often cited as the minimum acreage for sustainable forestry. A five acre houselot is not a self-sustaining unit of manageable forest land.

Third, land use conflicts arise between forestry and farming operations and nearby residential areas. Increased taxes for increased municipal services (like sewer lines and road maintenance) cut into the often slim profits made by working farmers and woodlot owners. Disputes over noisy machinery, the smell of manure, and other rural characteristics also arise between new residential landowners and farmers and

Development of a Comprehensive Plan in a Southern Maine Town

Inventory. — Citizens in a small southern Maine town volunteered to do the inventory for the comprehensive land use plan. Following State Planning Office guidelines, and with additional guidance from a professional planner from the Greater Portland Council of Governments, the Comprehensive Planning Committee inventoried traffic patterns and volume, growth in residential and commercial development, existing natural resources and other aspects of the town.

Citizen Participation — The committee decided it was important to include input from town residents at an early stage of the process, instead of waiting until the inventory and analysis were finished and presenting the information in a public meeting. The committee developed a public opinion survey in order to find out what taxpayers thought was important to the town’s future. To encourage participation, the town offered the chance to win a \$200 cash prize to everyone who filled out and returned the survey. This cash incentive resulted in a high return rate (*over 50%*) of surveys.

Data Analysis and Town Objectives — Once the data and public opinion surveys were collected, a planner from the Greater Portland Council of

Governments assisted with data analysis and worked with the committee to develop objectives that would help create policies to guide planning decisions during the life of the comprehensive land use plan (*CLUP’s must be updated every ten years*). Many objectives were identified, including a desire by town residents to have more open space and have public access to Sebago Lake. Stopping further commercial development or expansion south of the Route 302 corridor was proposed in the interest of protecting the lake and the natural resources and aesthetic values associated with it. When fully developed, the town voted to approve the plan.

Implementation — In an effort to follow the objectives identified in the plan, the comprehensive planning Committee held neighborhood “Living Room Meetings” to try to involve landowners in identifying land protection options and working together to make crucial land use decisions. It didn’t work. People were unwilling to tell their neighbors how they ought to use their land. They didn’t particularly want their neighbors to tell them what to do with theirs, either.

Efforts to actively promote the objectives of the plan faded after this failed effort, but they didn’t stop. A few town members started a local newsletter and wrote newspaper articles highlighting the

woodlot owners.

Fourth, owners of larger parcels of forested land often view their land as an emergency savings account or retirement fund that can be tapped when need arises or real estate prices are high. They often don't want any restrictions against selling their land for the highest market value.

The Maine State Planning Office publication *Comprehensive Planning: A Manual for Maine's Communities* includes a full discussion in the Agriculture and Forestry Chapter of key issues that planning committees must address. It also provides guidance in policy development by offering

four categories of strategies designed to protect and manage forest land a) protecting the resource, b) enhancing economic ability, c) protecting the right to manage woodlands and d) encouraging markets. These groupings help to organize the local approach to land use planning and consider regulatory and non-regulatory options.

In addition, consider the guidelines on the following page to ensure your comprehensive plan incorporates the wide variety of benefits offered by forest land.

The Maine State Planning Office publication Comprehensive Planning: A Manual for Maine's Communities is an essential tool for planning committees and conservation commissions. It includes a full discussion of key issues in the Agriculture and Forestry Chapter and provides guidance in policy development.

concerns of rapid development and municipal costs associated with sprawl.

Challenges to the Comprehensive Land Use Plan

After the plan was approved by voters, a candle making business approached the town planning board for a permit to expand. The planning board approved the request. There was only one problem. The candle factory was on the south side of Route 302 — an area designated in the comprehensive plan as closed to further commercial development. The town attorney stepped in to make the planning board aware of the prohibition; if they wanted to approve the expansion of the candle factory then it required a change to the comprehensive plan.

The planning board decided to pursue a change in the plan to allow the candle factory to expand, and the attorney started the process that would allow this to happen.

This effort re-energized the volunteer comprehensive planning committee that had worked to develop the plan from start to finish. They published numerous articles on the proposed expansion and the challenge to the plan. As a result of their commitment, and the strong directions outlined in the plan itself, the town rejected the vote to allow a zoning change favoring increased commercial

development on the lake side of Route 302.

How the Comprehensive Plan Guided Other Town Planning Decisions

Mobile Home Park — Locations where mobile home park could be developed were identified in the comprehensive plan, even though there were no proposed developments when the plan was completed and approved. When a developer decided to locate a mobile home park in a non-approved area, the attempt was shot down by the strong direction of the plan. He decided to develop the park in an approved area, instead.

Purchase of a Town Beach — One major town objective that became part of the plan was increasing public access to Sebago Lake. Under the guidance of the plan, beach property was purchased by the State of Maine through the Land for Maine's Future program, which is administered by the State Planning Office. The town continues to manage the land through the proceeds from fee collections.

Morgan Meadow — Following the objective to acquire more public open space, 1100 acres were also acquired through the Land for Maine's Future program.

1. Assure a Sustainable Supply of Forest Products — What strategy will the town take to encourage landowners to practice ecologically based stewardship on their land in the interest of the continuous production and the long term protection of forest land?

2. Protect Significant Natural Areas — What are the public trust resources and important public values at stake? What are the most effective strategies to protect them? How can landowners be encouraged to voluntarily protect these areas? What kinds of forest management activities can protect or enhance these values?

3. Encourage Lands Enrolled in the Tree Growth Tax Program or Farm and Open Space Program — These areas should be designated as rural lands. How will the municipality encourage maintaining current use of this land? It would be inconsistent to include working rural areas within a larger growth area designation.

4. Protect Forested Urban Areas — How will the town encourage owners and developers to include trees in their landscaping plans? Will the town include trees while planning open spaces or parks? How will the town help protect or maintain these areas?

5. Protect Vernal Pools, Wetlands and Water Resources — Protection can occur through proper management (*which includes sensitive harvesting of timber surrounding these areas*). What policies will the municipality adopt to protect water resources while still allowing timber harvesting? What

forms of forest recreation are compatible in these areas?

6. Protect Prime Forest Soils — Often these soils are prime soils for development, waste disposal, or other non-forest uses. What policies will the municipality develop to encourage land owners to keep these prime soils in an undeveloped condition?

7. Protect Sensitive Natural Features — It may be necessary to limit forestry activities on sensitive sites. What policies will the municipality adopt to protect these sites while still allowing for careful forest management?

8. Provide Affordable Housing. — How will the municipality guide residential development while protecting the integrity of local forests? Will the municipality encourage intensive residential development (*such as conservation developments or “cluster housing”*) near or in forests, or will it allow non-intensive development (*such as standard style subdivisions*)? What will be the impact of either choice?

9. Discourage Forest Fragmentation — Forest fragmentation (*breaking up large tracts of forest lands into small pieces which compromises biodiversity and forest management opportunities*), should be avoided as much as possible. The town can encourage adjacent owners of small parcels to cooperate in forest management activities by developing collaborative management plans so larger forested areas can be managed as a unit.

10. Protect Against Hazards — How will the municipality reduce

wildfire risk and forest insect and disease epidemics? For example, the town can require logging slash to be lopped and scattered, require that roads be constructed to standards that support fire suppression equipment, and require access to and protection of strategically located sources of water for fire control. Consider requiring two road exits large enough to accommodate fire engines in all new developments located in or near forested areas so fire fighters have access and escape routes.

11. Promote Street and Shade Trees — The town may also want to undertake a community forest/shade tree pruning and maintenance program as an effective way to reduce vulnerability to destructive insects and disease, enhance downtown or village areas, and take advantage of other benefits derived from community forestry. How will the municipality promote this?

12. Discourage Incompatible Development — How will the town discourage incompatible development in forested areas? If an analysis of where new development is occurring indicates that new development, especially residential development, is occurring in rural areas more than anticipated, how can existing policies and programs be improved? For example, local building requirements are often more strict for village areas than they are for rural areas, which tends to discourage growth in the villages and encourage it in the rural areas.

Once recommended policies are identified by the committee, a

discussion of strategies that a comprehensive plan may include to implement recommended policies is the next step in the process. Again, refer to the Maine State Planning Office manual for additional guidance.

Implementation: Practical Strategies to Reach Municipal Goals

The implementation section of the comprehensive plan provides a practical work plan that will translate policies into on-the-ground changes. Strategies may include non-regulatory approaches such as: landowner incentives and assistance, buying forest land with state or local funds, or buying development rights from willing private forest land owners. Educational outreach to landowners may be another non-regulatory strategy to stimulate community discussion and raise awareness about how best to manage natural resources (*See the Clip-n-Copy pages in the appendix section of this guide for information handouts that are easy to copy and distribute to landowners*). Regulatory ordinances are another tool for reaching town goals. They need not create unnecessary hardships for forest land owners, developers, or the town, but creative thinking is essential in moving beyond traditional strategies for using, conserving, or protecting land.

Strategy Requirements

According to the Maine State Planning Office, specific strategies designed to carry out policies should do the following in order to be effective:

- ▶ Describe the specific activity or activities that support a specific policy.
- ▶ Designate responsibility for coordinating or conducting each specific activity.
- ▶ Provide a schedule for completing each activity.
- ▶ Estimate the cost of each activity.
- ▶ If a cost is associated with an activity, identify funding sources.

Coordinating with Neighboring Towns

Since forestry and natural resource planning concerns don't stop at municipal boundaries, it is important to work with neighboring towns to achieve the goals outlined in the planning process. For example, the protection of drinking water supplied from lakes, reduction of stormwater run-off, wildlife habitat protection and other natural resource considerations often require the cooperation of several municipalities. Assistance in developing strategies for cooperation with neighboring towns is available from your regional planning council and additional assistance may be available from the Maine State Planning Office.

Critique of Existing Land-Use Regulations

A thorough critique of existing land use regulations, including state mandated zoning, will identify codes that do not meet policies identified in the Comprehensive Planning process. Changes should be identified and prioritized. If codes exist that do not meet policy objectives, identify how they can be improved to do so.

While model ordinance language is beyond the scope of this supplemental guide, assistance is available from a variety of sources. An effort to develop model ordinances that reduce sprawl and its associated impacts is currently underway at the Maine State Planning Office and will be available to guide municipalities in drafting or updating their own ordinances. Your regional planning council should be able to point out neighboring towns, or towns further afield, that can provide useful models. Refer to the Additional Resources section of this guide to find specific resources that provide model ordinance language and contact the Maine Forest Service for information on municipal forestry ordinance guidelines and assistance, and for model street and landscape tree ordinance information.

Evaluating Plan Effectiveness

Individual members of the planning committee or conservation commission may come and go over the course of ten years, so it is important to include guidelines within the plan to evaluate the effectiveness of implementation strategies in reaching identified goals and policies. Also state how often the plan should be reviewed and updated for effectiveness (*every two to five years is recommended by the Maine State Planning Office*).

Summary

Finally, the town must approve or reject the comprehensive land use plan. Since the policy development and implementation phases of the comprehensive plan process are likely to be the most contentious and discouraging, it is

in the best interest of those developing or updating the plan to engage the public early in the process, preferably during the inventory phase. Including key community leaders on the planning committee will help promote public dialogue during the early stages of development. If disagreements between stakeholders threaten to halt the process or significantly weaken the proposed plan, consider acquiring the services of a

professional facilitator to get the process back on track. Newspaper columns, radio spots, public suppers and other outreach communication strategies are also well worth the time and effort.

The standard outreach strategy of holding comprehensive plan public meetings to gather citizen input rarely attracts large audiences, so it may seem to many that the finished plan was developed without public participation.

Springing the comprehensive plan on an unprepared public at a public meeting or at the final town meeting where the plan is up for a vote does not bode well for success. The best chance of adopting a comprehensive plan and having it actively used as a guide for future development hinges on wide community involvement from the beginning of the process.

Part Four

Resources and Contacts

Additional Resources

The Essential Reference

Comprehensive Planning: A Manual for Maine Communities. Maine State Planning Office. November, 1992. The manual for creating or updating a Comprehensive Land Use Plan in Maine. Free. For more information, contact the State Planning Office. (207) 287-3261. Website: <http://janus.state.me.us/spo>.

Economics of Land Use

The Cost of Sprawl. Maine State Planning Office. May, 1997. Covers the economics of standard residential development with some surprising and thought provoking data. Available from (207) 287-3261 or download the publication from www.state.me.us/spo.

Open Land, Development, Land Conservation and Property Taxes in Maine's Organized Municipalities. Brighton, D. for Maine Coast Heritage Trust. January, 1997. Looks at impact of land conservation and development on local property taxes with examples from Vinalhaven, Mount Desert and Freeport. Available from Maine Coast Heritage Trust, One Main Street, Topsham ME 04086. (207) 729-7366.

The Positive Economics of Conservation: Technical Bulletin No. 112. Maine Coast Heritage Trust. Assesses the cumulative costs of development and suggests why communities should assess their own development costs and benefits. Provides a list of additional resources, (including a com-

puter program to compute the fiscal cost of development from American Farmland Trust). Available from Maine Coast Heritage Trust. One Main Street, Topsham ME 04086. (207) 729-7366.

Forest Fire Prevention

Common Sense Fire Protection Standards for Real Estate Development in Rural Maine. Winter 1991. Fire Control Division of Maine Forest Service, Department of Conservation. Available from Fire Control Division of Maine Forest Service. 1-800-750-9777.

Wildfire is the Enemy of Your Forest Home. Fire Control Division of Maine Forest Service, Department of Conservation. Available from Fire Control Division of Maine Forest Service. 1-800-750-9777.

Forestry and Forest Management

Community Forestry

Community Forestry and Urban Growth: A Toolbox for Incorporating Urban Forestry Elements Into Community Plans. McFarland, K. 1994. Olympia, Washington. Available from Washington State Department of Natural Resources. (360) 902-1000.

Biodiversity

Wildlife Habitat/Hazard Tree Decision Model. Informative pamphlet that shows you how to decide whether it is best to keep a tree for wildlife purposes or cut it down for safety reasons. Available from USDA Forest Service,

Northeastern Area State and Private Forestry. (603) 868-7600. Also available from the Maine Forest Service. 1-800-367-0223.

Biodiversity in the Forests of Maine: Guidelines for Land Management. Flatbo, G., C. R. Foss and S. K. Pelletier. 1999. UMCE Bulletin 7147. \$25.00. Describes characteristics that influence biological diversity and recommends voluntary forestry practices that can help maintain forest biodiversity in Maine. Available from University of Maine Cooperative Extension. 1-800-287-0274.

Forest Management

A Guide To Logging Aesthetics: Practical Tips for Loggers, Foresters and Landowners. Jones, Geoffrey T. 1993. Fifty color photographs and text describe cost-effective and proven practices that minimize negative impacts during and immediately after the harvest while enhancing the wildlife, recreational and aesthetic qualities of the woodlot. Bulletin #123NRAES60. \$7.00. Available from Cornell Cooperative Extension. (607) 255-2080. Website: <http://www.cce.cornell.edu/publications/natural-resources.html>.

Landowner's Guide to Forest Stewardship Practices. A series on the ecology, stewardship and management of small woodlands. Funded by the Stewardship Incentive Program, which assists owners of more than ten acres. Provides good background information specific to Maine for anyone who wants to know more about the forest in general and their property in particular.

Available from the Department of Conservation, Maine Forest Service. 1-800-367-0223.

Seeking Professional Forestry Assistance. Bulletin #7071.

Available from the University of Maine Cooperative Extension. 1-800-287-0274. Website: <http://www.umext.maine.edu>.

Selecting a Logger. (Brochure).

Gives options for choosing a logger. Available from the Department of Conservation, Maine Forest Service. 1-800-367-0223.

Timber Sales Contract. Bulletin #7074. University of Maine Cooperative Extension. 1-800-287-0274. Website: <http://www.umext.maine>.

The Woods in Your Backyard: A Landowner's Guide. Parrish, Christine R., July, 1999.

Introduces how the woods work in Maine backyards and woodlots including basic forest ecology, wildlife habitat, critical areas and non-timber forest products. Family projects show how to get the whole family and neighborhood interested in the backyard woods while having fun. Non-technical. Available from Department of Conservation, Maine Forest Service, 22 State House Station, Augusta ME 04333. 1-800-367-0223.

Working with Your Woodland: A Landowner's Guide. Beattie, Mollie et al. 1993. Hanover, NH: University Press of New England. \$22.00. A comprehensive and easy to understand guide for landowners (including municipalities) interested in sound conservation

forest management and timber harvesting. Order from your local bookstore or purchase on-line at Amazon.com.

Citizens Guides to Comprehensive Land Use Planning

Getting Involved: A Citizen's Guide to Local Planning. Natural Resources Council of Maine. An introduction of how citizen's can get involved in the land use planning process for their town and practical suggestions of how to proceed through the comprehensive planning process. Out of print, but photocopies available from NRCM, 271 State Street, Augusta ME 04330-6900. (207) 622-4343.

Where We Live: A Citizen's Guide to Conducting a Community Environmental Inventory. Harker, Donald F. and Elizabeth Ungar Natter. 1995. Washington, DC Island Press. \$18.65. A practical workbook to help citizens find information concerning their local environment and to use that information to further their community land use goals. Order from your local bookstore. Also available from Acorn Naturalists. 1-800-422-8886.

Land Conservation & Open Space Planning

American Farmland Trust. Works at the local and federal level to conserve working farmland. The tools and techniques section of this website will help farmers, public officials, conservationists and other citizens understand how to protect precious agricultural land and landscapes, including forest

land. Website: www.farmland.org. ***Conservation Options: A Guide for Maine Landowners.*** Schauffler, F. M. 1994. Brunswick, Maine: The book explains how to protect land in ways that make good financial sense for the all involved. Available from Maine Coast Heritage Trust. (207) 729-7366.

Conservation Works. National Park Service. 1996. A booklet on creating trails, enhancing waterways and developing open spaces in towns and cities. The Androscoggin Greenways are used as an example. Website: <http://www.cr.nps.gov/rtca/rtca-home.html>.

Creating Open Space Networks Through Conservation Subdivision Design. (Video) Arendt, Randall. A step-by-step introduction to combining natural resource conservation and subdivision design in an economically advantageous way. Available on loan from the Maine Forest Service. Contact the Natural Science Educator. (207) 287-4988.

Forest Legacy: Protecting America's Private Forest Heritage. A brochure explaining the Forest Legacy Program and conservation easements. American Forestry Association. Available from the Maine Forest Service, Department of Conservation. 1-800-367-0223.

Land for Maine's Future Program. A voter approved state program to acquire lands of state significance from willing sellers. Handles purchases and conservation easements of lands for the purposes of public access, natural resource conservation and historical value. Municipalities may manage prop-

erties under LMF guidelines. Anyone may submit a proposal for consideration. For more information, contact Maine State Planning Office (207)287-1487. Website: www.state.me.us/spo.lmf.

Land Trust Alliance. Promotes voluntary land conservation and strengthens the land trust movement by providing the leadership, information, skills and resources land trusts need to conserve land for the benefit of communities and natural systems. Offers descriptions and examples of land protection options. Website: <http://www.lta.org>.

Lincoln Institute of Land Policy. A nonprofit educational institution established to study and teach land policy and taxation. Three program areas: taxation of land and buildings; land markets; and land as common property. Their goal is to make knowledge about these subjects easy to understand for citizens, policy makers and scholars in order to improve public and private decision making. 113 Brattle Street, Cambridge, MA 02138-3400. (617) 661-3016. Website: www.lincolninst.edu.

Maine Coast Heritage Trust. Provides conservation advisory services to landowners, local land trusts and state and community officials free of charge. One Main Street, Topsham ME 04086. (207) 729-7366. Or P.O. Box 426, Northeast Harbor, ME 04662. (207) 276-5156. Website: www.mcht.org.

Maine Land Trust Network. A Maine Coast Heritage Trust sponsored network of statewide land trusts. Contact the Maine Coast

Heritage Trust or the Website: www.mltn.org.

Open Space Planning: A Guide for Preserving Your Community's Natural Resources and Quality of Life. Available from the Maine Department of Conservation, Grants and Community Recreation Division, Bureau of Parks and Lands. (207) 287-4905.

What Do Trees Have To Do With It? Forestry, Natural Resources and Comprehensive Planning (Video). Maine Forest Service. Edited video of conference is a good introduction for comprehensive planning committees and conservation commissions on how forests and natural resources fit into the planning process. Free. Contact the Natural Science Educator (207) 287-4988.

Land Use Ordinance and Zoning Guidelines

Effects of Traditional Zoning

The Hidden Design in Land Use Ordinances: Assessing the Visual Impact of Dimensions Used for Town Planning in Maine Landscapes. Craighead, Paula M. March, 1991. MAC/USM Design Arts Project. New England Studies Program, University of Southern Maine. \$9.95. Shows the common result of land use ordinances that were put in place to "preserve the rural character of our town" and failed to do just that. Illustrates why common zoning practices failed and shows how to better reach the goal of maintaining a real "rural" town. Available from USM/New England Studies, 11 Granite Street, Portland ME 04203.

Sprawl Web Page. Maine Real Estate and Development Association. For more background on sprawl dialogue in Maine and around the country, visit this page for links on specific topics associated with sprawl. Website: www/mereda.org/sprawl.htm.

Working Landscapes: Are We Zoning Our Farmland, Forest Land and Wildlife Habitat Out of Existence? This booklet argues for functional minimum lot sizes for working farm and forest land and wildlife habitat conservation based on research and analysis. Available from Natural Resources Council of Maine. 271 State Street, Augusta ME 04330-6900. (207) 622-4343.

Forestry

Forestry Ordinances: Legal Definitions. Maine Forest Service, 1990. Augusta, Maine. Terms (and associated definitions) that must be used in municipal forestry ordinances. 1-800-367-0223.

Forestry Ordinances: Guidelines. Maine Forest Service, 1990. Augusta, Maine. Basic guidelines for writing municipal forestry ordinances. 1-800-367-0223.

Municipal Tree Ordinances

How to Write a Municipal Tree Ordinance. The National Arbor Day Foundation. Tree City Bulletin No. 9. Contact the Maine Forest Service Community Forester for more information. 1-800-367-0223.

Models and Standards for Municipal Tree Ordinances. Offers examples of tree ordinance provisions and methods for monitoring and managing trees. Also provides practical information on how to address the public's attitude about trees. Website: <http://www.isa-arbor.com/tree-ord.ordintro.htm>.

Subdivision Ordinances

Growing Greener: Putting Conservation into Local Plans and Ordinances. Arendt, Randall. 1999. Washington, DC Island Press. \$42.50. A practical, thorough and easy to use workbook on designing subdivision ordinances, comprehensive plans and zoning ordinance changes that are economical and environmentally sound. Model ordinances and Maine examples included. Available from the publisher. 1-800-828-1302.

Model Subdivision Ordinance. Available from the Maine State Planning Office. (207) 287-3261 Website: <http://janus.state.me.us/spo>.

Maine Forestry Laws

A Field Guide to Laws Pertaining to Timber Harvesting in Organized Areas of Maine. Maine Department of Environmental Protection, 1998. Augusta, Maine. This booklet describes the five state laws that impact timber harvesting in Maine's organized municipalities. An easy to follow guide that cuts through the extensive text of these laws and regulations and provides a simpler, easy to understand version. Available from Maine DEP. 1-800-452-1942.

Maine Forest Practices Act. Maine Forest Service, 1999. Augusta, Maine. Describes the Forest Practices Act which governs timber harvesting activity in the state of Maine, specifically Title 12: Conservation, Part 11: Forestry, Chapter 805: Cooperative Forestry Management, Subchapter III-A Forest Practices. Available from Maine Forest Service. 1-800-367-0223.

Maine Forest Service Rules-Chapter 20: Forest Regeneration & Clearcutting Standards. Available from the Maine Forest Service, 1999. Augusta, Maine. 1-800-367-0223.

Maine Shoreland Zoning: A Handbook for Shoreland Owners. Maine Department of Environmental Protection, 1998. Augusta, Maine. This booklet describes the state's Shoreland Zoning Law and Guidelines, in words and picture, for shoreland owners. Available from Maine DEP. 1-800-452-1942.

Maine Forest Statistics & Forest Conditions

Forest-Land Owners of Maine, 1982. Birch, T. W., 1986. USDA Forest Service, Northeast Station, Resource Bulletin NE-90. A statistical analysis of parcel sizes and related land use in the state. Available free from USDA Forest Service, Publications Distribution, 359 Main Road, Delaware, OH 43015.

Private Forest-land Owners of the Northern United States. 1994. Birch, T. W., 1996. USDA Forest Service, Northeastern Forest Experiment Station, Resource

Bulletin NE-136. A statistical analysis of parcel sizes, land use and land use trends in New England. Available from USDA Forest Service, Publications Distribution, 359 Main Road, Delaware, OH 43015

Some Facts About Maine's Forestry Sector. Field, D.B. 1999. Orono, Maine. A historical and contemporary review, supported by research, of land use, wood products and forest economics. Available free from the University of Maine. (207) 581-2856.

The State of the Forest and Recommendations for Forest Sustainability Standards: Final Report to the Joint Standing Committee of the 119th Legislature on Agriculture, Conservation and Forestry. Maine Forest Service, 1999. Augusta, Maine. The State of the Forest report discusses major forest issues, with greater detail and analysis on key issues. The Maine Forest Service is required to report on the State of the Forest biannually. Available free. 1-800-367-0223.

Water Quality Protection and Management

Best Management Practices: Field Handbook. 1998. Augusta, Maine. A practical, easy to read pocket handbook that describes BMP's, and how they work in minimizing erosion. Available free from the Maine Forest Service. 1-800-367-0223.

Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources. Welsch, D. J. 1991. NA-PR-07-91. Radnor, PA \$2.00. Available

from the USDA Forest Service, Northeastern Area State and Private Forestry, Forest Resources Management. (202) 512-1800.

Protecting Maine Lakes from Phosphorus Pollution: A new planning guide for cities and towns.

Maine Department of Environmental Protection. Augusta, Maine. A practical, step-by-step procedure for protecting lakes from phosphorus pollution. Available from the Maine DEP. 1-800-452-1942.

Protecting Water Quality During Trail or Road Construction in Forested Areas. Personal Contact: Morten Moesswilde, Water Quality Coordinator, Maine Forest Service. (207) 287-8430 E:mail: morten_moesswilde@state.me.us.

The Importance of Streamside Buffers: A Guide for Landowners and Land-Use Decision Makers. (Brochure). 1997. The benefits of streamside buffers on water quality are discussed. Available from the Rivers Alliance of Connecticut. (860) 693-1602

Streams. Augusta, Maine. An easy to read brochure on streams, their functions and ecology. Available from the Maine Department of Environmental Protection. 1-800-452-1942.

Regional Planning Councils

Regional Councils assist town planning boards, comprehensive planning committees, conservation commissions and others with information, technical expertise and advice. They are a useful regional resource for anyone involved in planning. Contact individual councils to find out more about the services they offer.

Androscoggin Valley Council of Governments

125 Manley Road
Auburn, ME 04210
Telephone: (207) 783-9186
E-mail: avcog@avcog.eddmaine.org

Greater Portland Council of Governments

233 Oxford Street
Portland, ME 04101
Telephone: (207) 774-9891
E-mail: rseeley@server.eddmaine.org

Hancock County Planning Commission

RR 4, Box 22
Ellsworth, ME 04605
Telephone: (207) 667-7131
E-mail: hcpc@acadia.net

Kennebec Valley Council of Governments

17 Main Street
Fairfield, ME 04937
Telephone: (207) 453-4258
E-mail: kvcog@kvcog.eddmaine.org

Merrymeeting Council of Governments

8 Lincoln Street
Brunswick, ME 04011
Telephone: (207) 729-0144
E-mail: mcbd@zwi.net

Mid-Coast Regional Planning Commission

218 Main Street, Suite 15
PO Box 1315
Rockland, ME 04841
Telephone: (207) 594-2299
E-mail: planning@midcoast.com

Northern Maine Development Commission

PO Box 779
Caribou, ME 04736
Telephone: (207) 498-8736
or 1-800-427-8736
E-mail: nmdc@nmdc.org

Penobscot Valley Council of Governments

1 Cumberland Plaza, Suite 300
PO Box 2579
Bangor, ME 04401-2579
Telephone: (207) 942-6389
E-mail: dbennett@emdc.org

Southern Maine Regional Planning Commission

255 Main Street
PO Box Q
Sanford, ME 04073-1325
Telephone: (207) 324-2952
E-mail: smrpc@ime.net

Washington County Regional Planning Commission

63 Main Street
Machias, ME 04654
Telephone: (207) 255-8686
E-mail: dbennett@emdc.org

Designing Municipal Ordinances that Work

While towns will want to consider a range of regulatory and non-regulatory strategies for implementing the vision supplied by the comprehensive plan, well crafted ordinances can be a powerful tool used to conserve working forests and farms, preserve scenic views, protect water quality and wildlife habitat, provide recreational opportunities and reduce municipal expense. Possible ordinances that a town may consider include:

- ▶ Timber harvesting (*must be approved by the Maine Forest Service*)
- ▶ Town trees
- ▶ Trees adjacent to Right of Way's
- ▶ Town forests
- ▶ Sub-divisions
- ▶ Trees and shrub plantings in new developments
- ▶ Shoreland zoning (*in excess of state minimums*)
- ▶ Scenic view protection
- ▶ Wildfire prevention

During the crafting of an ordinance, planners should take care that the regulation actually achieves the desired goal. Unintended consequences are all too common, since regulations set the floor for minimum acceptable performance. They do not necessarily promote excellence and may serve as a disincentive to landowners. For example, a restrictive timber harvesting ordinance may have the unintended consequence of either encouraging landowners to cut their most valuable timber

(*high-grading or liquidation harvesting*), or getting out of forest management altogether and selling the land for development. Likewise, a subdivision ordinance with a large minimum lot size enacted in an attempt to preserve the rural character of a municipality actually does the reverse; it encourages residential development to spread further and further across the forested landscape.

Given these precautions, well designed municipal ordinances are effective at protecting natural resource values. Municipalities may also amend existing ordinances to protect those values. For example, a town may require a wider setback zone than is required by the state shoreland zoning in order to protect the water quality of a lake that supplies town water. Or a town may amend a subdivision ordinance to enhance open space by basing the number of housing units on density rather than on minimum lot sizes.

While a comprehensive plan guides the decision on whether an ordinance should be considered as a tool to reach planning goals, all ordinances should be written so they are easy to understand. They should also include the following basic information:

- ▶ Why the town needs the ordinance
- ▶ Who is affected by it
- ▶ Who enforces it
- ▶ How it may be appealed
- ▶ Where (*geographically*) it applies

A municipal ordinance needs to be practical, reasonable, legal and enforceable. That is, it should

not be vindictive nor deprive a landowner of all economic use of a property and it should advance a legitimate governmental interest. Landowners should also be provided with a clear avenue of appeal through an escape clause in the ordinance.

Model ordinances can be useful when drafting an ordinance, but must be tailored to the specific municipality. While the comprehensive plan serves as the overarching guide, model ordinances provide insight into the format, legal language and specifics to consider when drafting an ordinance. But there is no one-size-fits-all ordinance, since municipalities in Maine range from small rural villages to well populated cities and suburban towns. Many of the concerns facing these municipalities, such as rapid growth in residential areas and the increasing costs of municipal services, are the same, but the appropriate course of action may be quite different from one town to the next. Given this variety, it is important to adapt model ordinances as appropriate.

Municipalities should seek out the help and advice of planners experienced in crafting ordinances. See the list of Regional Planning Councils to contact your closest office for assistance and refer to the *Additional Resources* list in this publication to find guidelines for crafting specific ordinances. The Maine State Planning Office can also be of assistance: their *Municipal Handbook of Model Smart Growth Ordinances and Policies* is due out in 2001.

Glossary of Common Forestry Terms

Acre A unit of land measurement of 43,560 square feet; a square parcel of land approximately 208.5 feet on each side. A parcel of land 1 mile on each side contains 40 acres.

Aspect Direction towards which a slope faces; orientation of a slope face.

Available Water Capacity The capacity of a soil to hold water in a form available to plants.

Basal Area Area in square feet of the cross section of a tree trunk at breast height most commonly used as an indicator of stand density and expressed as square feet per acre. A tree with a 14" diameter has a basal area of just over one square foot.

Best Management Practices (BMPs) Guidelines for the reduction of erosion and sedimentation of water bodies (*streams, ponds, lakes, rivers, etc.*) from logging activities. A practice or combination of practices determined to be the most effective and practicable means of preventing negative impacts of silvicultural activities. Usually associated with erosion control measures and water quality practices.

Blaze To remove a spot of bark from a tree, usually with an axe, to make a semi-permanent mark. Commonly painted to indicate boundary lines.

Board Foot A unit of measure 1 foot long, 1 foot wide, and 1 inch

thick. Usually used for sawlog material only. A common symbol is MBF, which designates one thousand board feet. The average conversion commonly used is 2 cords = one thousand board feet.

Browse Leaves, buds and woody stems used as food by woodland mammals such as deer, moose and snowshoe hare.

Buffer Strip Vegetation left along a stream, lake, or wetland to protect aquatic life and water quality. Buffer strips filter sediment, provide food, maintain cool water temperatures and may increase diversity within a landscape.

Canopy The cover of branches and foliage formed by the tree crown. The size varies from species to species and covers a much larger area of the forest floor than basal area.

Clearcut A forest harvesting practice in which most or all trees are removed from a site. Clearcuts are used for immediate commercial purposes and for regeneration of future forests.

Coniferous Commonly called softwoods or evergreens. Although there are exceptions, most coniferous trees have cones and keep their needles through the winter.

Commercial Thinning Harvests which are aimed primarily at controlling the growth of stands through adjustment in stand density. Trees removed are useful and of value for some purpose. Income from the sale or use of products produced exceeds all costs associated with harvesting and removing timber.

Cord A unit of volume used in measuring wood products. A standard cord occupies 128 cubic feet of space and contains approximately 85 cubic feet of wood. It is commonly described as a close piled stack of wood 4 feet high, 8 feet long, with sticks 4 feet in length.

Crop Tree Those trees in a stand destined to form the final crop, usually the highest quality and value of all the trees in a stand. Crop trees may be selected from an immature stand and carried through until the final harvest.

Crown Upper portion of a tree which includes the limbs, branches, buds and leaves.

Cruise An organized survey of forest land to locate timber and estimate quantity by species, products, or other information; the estimate obtained in such a survey.

Deciduous Commonly referred to as hardwoods or broadleaved trees. In most cases they lose their leaves in the fall.

Density A measurement of a stand in terms of square feet of basal area, number of trees, or volume per acres. It reflects the degree of crowding of the stems within the stand. Expressed as basal area, it is a measure of the portion of an area occupied by trees. Expressed as a percentage of crown closure, it is an estimate of the extent the site is occupied.

Diameter Breast Height (DBH) The diameter of a tree (*outside bark*) at a point 4 feet above the ground.

Dominant Trees with crowns extending above the general level of the crown cover and receiving full light from above and partly from the side. Dominant trees are generally larger than average trees in the stand, with crowns well developed and partially crowded on the sides.

Even-aged Management

Managing a forest or forest stand to product a forest of trees of the same relative age. Even-aged management techniques include intermediate treatments, clearcuts, patch clearcuts and shelterwood cuts.

Even-aged Stand A stand of trees in which relatively small age differences exist. A stand is considered even-aged if the difference in age between the oldest and the youngest trees do not exceed twenty percent of the length of the rotation. Stands stocked with two distinct age classes are considered even-aged.

Forest Ecosystem All the plants, animals and chemical and physical processes which interact to sustain the forest. Trees and other organisms interact with each other and with the chemical and physical environment in complex ways.

Forest Management The application of sound forestry principles and practices to the operation of the woodlands.

Forest Type A group of trees, occupying a specific area and uniform in composition, species, age arrangement and condition, as to be distinguished from other adjoining forested areas.

Forester A person who has been professionally educated in forestry and in some states required to possess a license in order to practice. Licensing is required in Maine.

Hardwood Used to designate all broadleaved or deciduous trees as a class. This would include maples, birches, ashes, oaks, aspens, cherries, beech and other broadleaved trees.

Hardwood Type A forest in which hardwood tree species comprise at least 75% of the stand.

Height Class Used in defining a stand of trees. Height classes are usually divided into trees of less than 35 feet in height, trees from 35 feet to 64 feet and trees greater than 65 feet in height.

Highgrading Selective removal of the most economically valuable trees without improvements in the remaining forest.

Intolerance The inability of a tree to develop and grow in the shade of and in competition with other trees.

Landing A place where logs and pulp are assembled for loading and transportation to a mill

Mast Any nut, seed, or fruit produced by woody plants and consumed by wildlife.

Merchantable Refers to forest products which can be harvested and sold; trees of commercial value.

Natural Regeneration Seedlings from natural seeding or sprouts and other plants representing vegetative reproduction.

Patch Cut/ Patch Clearcut

Removal of all trees within designated small areas in the harvest area. Areas are larger than those cut in a group selection method harvest. An even-aged management technique.

Pole Size A DBH size class representing trees that are usually more than 4 inches in DBH and less than 10 inches DBH; generally over 20 feet in height.

Precommercial Thinning

Cuttings which are aimed primarily at controlling the growth of stands through adjustments in stand density. Income from the sale or use of products produced do not exceed costs associated with harvesting and removing timber.

Pulpwood Wood cut primarily for the manufacture of paper, usually the lower quality portions of a tree.

Residual Stand Those trees remaining uncut (*and hopefully undamaged*) following a cutting operation.

Release The process by which young stands of desirable trees, not past the sapling stage, are freed from the competition of undesirable trees that threaten to suppress them.

Rotation Age The age at which the timber stand is considered ready for harvesting under the approved plan of management.

Sanitation Cut Removal of diseased, damaged, overmature, or undesirable stems from a stand.

Sapling A young tree less than 4 inches DBH. The minimum size of saplings is usually placed at 1 inch DBH. Saplings are generally 3 to 20 feet tall.

Sawlog/ Sawtimber A log large enough to permit production of lumber or other products by sawing. Size and cull percent permitted must be specified in any contract and will vary with local practice. Usually greater than 10 inches DBH for softwoods and 12 inches DBH for hardwoods.

Seed Tree Harvest Removing trees in a mature stand so as to effect permanent opening of its canopy and so provide conditions for securing regeneration from the seed of trees retained for that purpose. An even-aged management technique.

Seedling Trees that are less than 3 feet tall.

Selection Harvest The removal of trees either as single scattered individuals or in small groups, at relatively short intervals repeated indefinitely so that the continuous establishment of regeneration is encouraged and an uneven-aged stand is maintained.

Shelterwood A system of management requiring the removal of the mature timber in a series of cuttings over a period of time which establishes essentially even-aged regeneration under the partial shelter of seed trees.

Silviculture The theory and practice of controlling forest establishment, composition and growth.

Site Index A measure of site quality (*productivity*) for a given tree species or group of tree species. The site index is the average height of a tree species or group of species at a standard age (*usually 50 years*).

Snags Dead standing trees, often with tops broken off, which serve as perches, lookouts, foraging and home sites for wildlife.

Softwood Used to designate all coniferous (*cone bearing*) species as a class. This would include spruces, pines, balsam fir, hemlock, cedar, larch or hackmatack and other cone bearing species.

Softwood Type A forest in which softwood tree species comprise at least 75% of the stocking.

Stand See Forest Type

Stocking Density of tree growth in the stand (*forest*), expressed in terms of trees per acre, basal area per acre, volume per acre, or percent crown closure.

Stumpage Value of standing, uncut trees.

Timber Stand Improvement (TSI) Precommercial or non-commercial activity designed to improve tree and stand quality and/or release the potential crop trees in a stand. May include thinning, weeding and pruning.

Thinning Removal of some trees in a stand to increase growing space thereby improving growth rate and/or quality in the remaining trees.

Uneven-aged Management Managing a forest or forest stand to produce three or more distinct age classes of trees.

Uneven-aged Stand A forest or stand composed of intermingling trees that differ markedly in age.

Vernal Pool An ephemeral body of water that fills in the spring, holds water for at least 10 days and dries up by fall some or all years and that does not contain fish.

Wildlife Habitat Four basic components of habitat are food, water, cover and space. Specific requirements for each of these components will vary with species, season of year and the age and sex of the animal.

Windfirm The ability of the root system of a tree to withstand wind pressure and keep the tree upright.

P a r t F i v e
Clip-n-Copy Pages

Outreach education to land owners is one strategy for promoting conservation of undeveloped forest land. The following Clip-n-Copy pages are easy to copy for distributing to landowners at town offices and other public locations.

Maine Forest Service Information and Technical Assistance

Information is Provided on the Following:

- ▶ Forest Practices Act and Rules
- ▶ Maine Tree Growth Tax Law
- ▶ Best Management Practices for Forestry
- ▶ Silvicultural Activities Report
- ▶ Directory of Wood Processors
- ▶ Stumpage Prices
- ▶ Wood Processors
- ▶ Shoreland Zoning
- ▶ Comprehensive Town Planning
- ▶ Timber Harvesting
- ▶ Small Woodlot Management
- ▶ Backyard Forestry
- ▶ Forest Insects and Disease
- ▶ Forest Fire Prevention

...And Much More. Call Us!

Technical and Field Assistance

- ▶ Community Forestry Grants Program
- ▶ Forest Stewardship Assistance Program for Small Woodlot Owners
- ▶ Rural Development Through Forestry Program
- ▶ Maine Forest Service Field Foresters
- ▶ Water Quality and Best Management Practices
- ▶ Utilization and Marketing of Forest Products
- ▶ Forest Insects and Disease
- ▶ Forest Fire Prevention

...and visit our website at <http://www.state.me.us/doc/mfs>



Maine Forest Service
22 State House Station, Augusta, Maine 04333
1-800-367-0223 or (207) 287-2791

**Protect Yourself —
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Protect Yourself and Your Land with a Timber Harvest Contract

A landowner should always have a written contract with a timber buyer (*logger*) if they plan to harvest timber. A written and signed contract is a legally binding document that protects both the landowner and the timber buyer by listing and clarifying the responsibilities of each party. For a sample contract, contact the Maine Forest Service and ask for a copy of *A Suggested Timber Sale Agreement*.

Landowners typically sell “stumpage” to a logger. Stumpage is the value of trees “on the stump” before they are cut. When selling stumpage to a logger, the landowner sells trees designated in the contract. Often with the assistance of a Licensed Professional Forester, the seller (*the landowner*) and the buyer (*the logger*) determine the volume of timber to be cut and negotiate the terms of payment and price per unit (*board foot, ton cord, etc.*).

At a minimum, a good timber sales contract should:

- ▶ Describe the land and boundary lines.
- ▶ Guarantee title to the property to be harvested.
- ▶ Include a map of your property with the harvest boundaries clearly marked.
- ▶ Specify the amount of timber to be harvested, the prices to be paid for the timber and the manner, time and method of payment
- ▶ Describe the timber being sold, its location and how it will be marked for identification.
- ▶ Describe the logging methods to be used, specify log standards and associated prices for different uses (*veneer logs and sawlogs, for example, are worth more than pulp*).
- ▶ Specify the location of log landings, roads and skid trails (*if desired*) and require that those areas be stabilized and revegetated (*if appropriate*) after harvesting.
- ▶ Specify the time period covered by the contract.
- ▶ Prohibit excessive damage to unmarked trees and improved property such as buildings, fences and roads.
- ▶ Specify the penalties the buyer must pay if unmarked trees are cut or damaged.
- ▶ Assign liability for losses caused by the buyer (*or his agents*) to protect the landowner from workers’ compensation claims, liability lawsuits and property damage claims.

If the logger is determined to be an independent contractor for workers’ compensation purposes, the contract must contain the wording “The independent contractor will not hire any employees to assist in the wood harvesting without first providing the required certificate of insurance to the landowner.”

- ▶ Specify protection of soil, water and recreational values.
- ▶ Require the use of Best Management Practices where appropriate.
- ▶ Require that the buyer abide by all local, state and federal laws and regulations.
- ▶ Allow the sale agreement to be assigned to another logger only with the written consent of the seller.



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Protect Water and Wildlife During Timber Harvests: *Best Management Practices (BMP's) for Forestry*

Forest streams, lakes and rivers naturally have good, clean water. Proper timber harvesting can protect water quality and good forest management can improve it, but improper timber harvesting causes soil erosion and degrades water quality as a result.

How does it happen?

- ▶ Duff, slash and ground plants are removed and soil gets scraped off, torn up, or pushed away.
- ▶ Water movement occurs in the form of driving rain, melting snow, or high stream levels.
- ▶ Water accumulates and gathers enough speed to pick up soil.
- ▶ The increased flow of water deepens and widens a waterway, creating a fast moving channel.

The Result

Water with soil suspended in it flows across the ground and into a stream, river, or lake and dumps its load of mud onto the bottom. Or silt creates cloudy water far downstream. Fish and other small aquatic animals are choked as a result. The silt also buries fish eggs and smothers small insects and invertebrates that fish rely on for food. With nothing in place to slow water movement, each new rainfall cuts away at exposed soil and brings a fresh load of sediment into the waterway.

BMP techniques prevent erosion and poor water quality. Use them on forest roads, yards and landings, skid trails, stream crossings or wherever logging equipment operates.

BMP's prevent erosion by:

- ▶ Stabilizing the soil by maintaining natural vegetation that filters out silt, or by using natural or man-made materials to cover exposed soils.

- ▶ Slowing down water (*especially on steep slopes*) with water bars, skid humps, or other structures.
- ▶ Spreading water out by diverting it from exposed areas back into undisturbed vegetation.
- ▶ Preventing stream channels from deepening and widening.

The most important BMP: PLAN AHEAD.

- ▶ Know the direction water will flow across the ground and where it will end up.
- ▶ Identify natural water bodies and avoid harvesting activity near them when possible.
- ▶ Limit the area of disturbed soil or work only on frozen or snow-covered ground.
- ▶ Stabilize exposed soil with brush, mulch, or other materials BEFORE erosion occurs.
- ▶ Avoid steep slopes and use techniques to break up and divert the flow of water, BEFORE channels form in waterways.
- ▶ Use as few stream crossings as necessary and build them to accommodate high water levels.
- ▶ Stabilize and/or replant the area after the timber harvest.

The End Result

The end result is a timber harvest that keeps mud out of streams, rivers and ponds, avoids water quality problems, looks good and keeps fish and other aquatic life healthy.

Contact the Maine Forest Service for a booklet on Forest Water Quality BMP's.



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**Protect Yourself —
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Avoid Property Boundary Disputes

Robert Frost wrote: “Good fences make good neighbors.” This is as true today as when he wrote it. In fact, with more expensive land and higher timber values, good boundaries are even more important now than they were in the past. Timber trespass can be expensive in terms of money and lost time. The wise person avoids it.

The following information will help landowners avoid boundary problems:

Establishment

1. Only a licensed surveyor can establish a line where there are no existing monuments or blazes. Surveyors are licensed in the State of Maine under 32 MRSA § 13901 et seq. Copies of the law and a roster of land surveyors licensed to practice in Maine are available from the State Board of Licensure for Professional Land Surveyors (35 State House Station, Augusta, ME 04333; (207) 624-8603. The Land Surveyor uses information contained within the deeds of record and evidence obtained from measurements taken on the ground to establish a line.

2. The landowner or a licensed forester may maintain a line, or re-establish one where some monuments or blazes still exist. If you cannot sight from one blaze to another, you should probably get the line surveyed by a licensed surveyor. A boundary line shown simply by blazed trees may give the appearance of a boundary, but could be located differently after an accurate survey.

3. Monuments are established by the surveyor. They may include stone posts, iron bars and the like. Blazes should not be considered as a monument. Blazes are approximations of where the line lies. A cap listing the surveyor's license number must be placed on the corner posts.

4. Because blazed tree on the line may be evidence of the exact location of the line (*serving as witness trees*) they should not be cut. They generally have little value for timber, since the blaze or old fencing tacked to the boundary provides an avenue for bacteria and fungi to invade, which causes rot. Additionally, iron from a fence or other item tacked to the tree will cause the sawmill to reject the log when it arrives.

5. When there is a disagreement about a line, it should be surveyed. Adjacent landowners may agree to share the cost of the survey, but this arrangement should be agreed on before the survey is done. Before permanently marking the boundary by either blazing or painting, it is best to walk the line with the adjoining owner to ensure the boundary location is mutually agreeable.

Maintenance

1. Boundaries should be painted with a high quality, easily seen paint, such as yellow, orange, blue, or red. These colors are visible for long distances. Use high grade paint for durability. Inexpensive paint will wear off. Paint specifically formulated for boundaries are available from forestry supply companies. Apply paint only when bark is warm and dry for good penetration and staying power. Paint witness trees at the intersection of boundary lines.

2. In blazing and painting trees along the boundary line, the following rule is used:

a. If the line passes through the middle of the tree, blaze and paint on both sides of the tree where the line passes through the tree.

b. Where the lines passes adjacent to the tree, blaze and paint one point immediately adjacent to the line.

c. Be sure to blaze and paint both sides of the line so that it can be seen from either side.

This will help prevent accidental trespass.

3. If possible, avoid blazing large size trees of commercial species, as this encourages decay. Blazes should be 4 to 5 inches in diameter and located approximately five feet above the ground. Blaze often enough so that it is possible to see the next spot easily.

4. Boundary lines should be brushed out for easy traveling and locating. Pruning of limbs up to head high and cutting down small trees along the line will help. Cutting any vegetation on another's property requires permission. Check with the adjoining landowner before proceeding.

5. Corner posts should be of some permanent material, with adjoining trees (*witnesses*) marked so they are easy to locate. Trees (*except for long lasting*



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Avoid Property Boundary Disputes *continued*

cedar) are poor corner posts since they rot, fall to the ground and disintegrate within a few years. Stone provides a more permanent corner, but it is heavy and difficult to transport. Iron pipe is long lasting, easily transported and inexpensive. It drives easily into the ground, whereas holes must be dug for stone posts. If possible, always pile smaller, easily available stones around any corner post. Paint corner posts.

6. High quality paint, properly applied, should last at least ten years in the woods; axe blazes should last longer. For best results, lines should be checked annually to be sure that they are still in good shape. Lines and corners should be shown and explained to family members so they can locate them.

Timber Harvesting & Boundaries

1. A landowner who authorizes cutting timber (*for any purpose*) on their property (*when the cutting involves an area of 10 or more acres*) is responsible for clearly marking any property lines within 200 feet of the areas to be cut. The landowner may authorize another individual to mark the property line. If the property lines are not clearly marked and timber is cut from an abutting property without the authorization of the abutting landowner, the landowner who initiated the timber harvest (*or the authorized agent of the landowner, or both*) who failed to mark the property lines is liable in a civil action (*with double damages*) to the owner of the abutting land (14 MRSA '7552-A).

2. Whoever (*stumpage owner, operator, landowner, or agent*) cuts, causes or allows the cutting of any forest

growth on abutting land that is outside the limits of the unorganized territory (*or within the unorganized territory but which borders property outside of it*) shall dispose of the slash in the following manner:

All slash resulting from cutting of forest growth shall not remain on the ground within 25 feet of the property line, if the director of the Maine Forest Service (*on his own initiative or on written complaint of another*) declares that the situation constitutes a fire hazard.

All slash resulting from cutting of forest growth shall be removed the required and scattered or chipped (*not piled in windrows*) within 30 days after cutting or within 30 days of notification to remove by the director of the Maine Forest Service.

"Slash" is legally defined as branches, bark, tops, chunks, cull logs, uprooted stumps and broken or uprooted trees left on the ground as a result of logging, right-of-way construction or maintenance and land clearance (12 MRSA '9331 - 9336).



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